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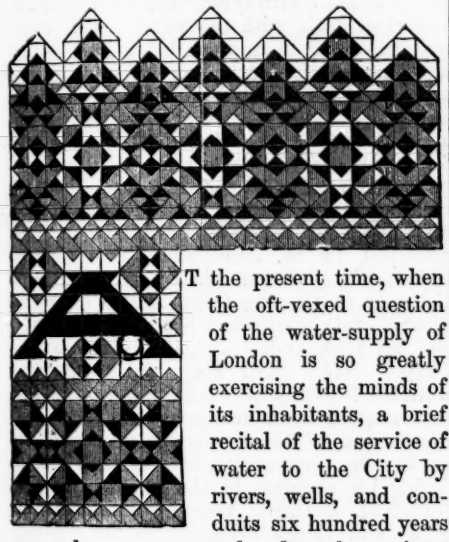
London's Mediæval Water Supply.

Natural and Artificial.



AT the present time, when the oft-vexed question of the water-supply of London is so greatly exercising the minds of its inhabitants, a brief recital of the service of water to the City by rivers, wells, and conduits six hundred years ago and more, may not be altogether uninteresting.

Until nearly two centuries and a half after the Norman Conquest, London derived its supplies of water from the Thames; "The River of Wels, as it was then called, on the west; with water called Walbrooke running through the midst of the Citie into the River of Thames,—serving the heart thereof,—and with a fourth Water or Bourne, which run within the Citie through Langbourne Ward, watering that part in the east. In the west was also another great water, called Oldbourne." So writes Stow, blending, as he sometimes does, tradition and fact.

The Wall-brook, of which the Romans drank and on whose banks they built their villas, rose to the north of London beyond the present site of Moorfields and Finsbury-square on the Moor of "Haliwelle and Vynesbery," and, at a later date, called Finsbury Fields. Probably more than one brook supplied the rivulet. After minute investigation by those well-known archæologists, John E. Price and Alfred White, it appears that the eastern tributary rose near the south end of the New North-road in the direction of Pitfield-street, Hoxton; thence, by Willow-walk, across the Curtain-road, by King John's-court, to Holywell-lane, and followed a course east of the entire length of Long-alley; thence, by the old burial-ground of Bethlehem Hospital and along Blomfield-street, to the west of the churchyard of All Hallows, London Wall, where it entered the ditch of the City wall. Leaving the ditch at the top of Little Bell-alley, with a sharp turn by St. Margaret's, Lothbury, it crossed what is now Princes-street, and pursued its course Thameswards beneath Grocers' Hall and St. Mildred's Court. The Wall-brook is mentioned in a charter of William I. to the College of St. Martin-le-Grand, the site of which is partly occupied by the General Post-office:—"To the church of the Blessed Martin, situated within the walls of London, I give and grant to the said church for the redemption of the souls of my father and mother, all the land and moor outside the postern called Cripeles-gate, on either side of the postern, to wit, from the northern angle of the City wall, where a river of wells marks it out, as far as the running water [*aquam currentem*] which enters the City." The course of the "running water" inside the wall was an important boundary-mark in the early years of the City. In the "Liber Albus" it is written that when a person is bound to clear himself by the Great Law,—the law appertaining to homicide and murder,—he shall select thirty-six jurors, eighteen to be chosen from the east side of the "Wale-brooke" and eighteen from the west, &c. The brook divided the twelve eastern from the twelve western Wards of the City, whose rulers jealously tried to guard it from pollution by many strict ordinances. Every householder on the banks of the brook, from the Moor to the Thames, was bound by law to keep a rake for the purpose of intercepting any refuse thrown into it. In the City Records such entries as "That the course of the Wall-brook shall be cleansed," "That certain men be sworn to keep the water-course of Wall-brook," are of frequent occurrence. At an inquisition before the Mayor in 1300, it was decided that the parishioners of St. Stephen's are bound to repair the covering over the water-course of "Walebroc." So many coverings and bridges were placed over the brook that at last it was hidden from sight and degraded into a common sewer. Stow writes:—"It hath been a common speech [tradition ?] that, when the Wallbrook did lie open, barges were rowed out of the Thames and towed up as far as Bucklesbury, after one Buckle, who there dwelt and kept his courts."(?)

That the water of the Thames was used for domestic purposes in early times is shown by the coroner's roll, under date June 17th, 1276, when an inquest was held on Henry Greene, a water-carrier, who was found dead in the river. The evidence showed that Henry, having come to St. Paul's Wharf, with a tankard, and intending to take water with it, entered a boat, and having filled the tankard attempted to place it on the wharf, and in so doing the boat moved away and he fell into the water. The tankards used then, and for centuries after, by the London water-carriers contained about three gallons, were hooped, and shaped like the frustum of a cone, with an iron handle and a bung at the upper end. A number of families used the Thames water, "fetching it by the many lanes which led to the water-side, but in time many of these were stopt up by those that dwelt thereabouts, for their own gain, who would suffer none to pass without paying a duty." Among the closed lanes and bridges were Fish Wharf-lane, where Simon of Twynham took custom Armentere's-lane, where there was a convenient bridge, was blocked up by a cook-shop; and Dowesgate-lane, where they had made buildings consisting of divers houses of office, and filth fell on the passers-by, to the disgrace of the commonalty. In the time of Edward III. there was a bridge in Timberhythe, to the west of Queenhythe, which was common to all the citizens for the purpose of washing clothes and taking supplies of water. It was named "Laundresbrigge." In 1326, according to the French Chronicle of London, which was compiled in the earlier half of the fourteenth century, "For want of fresh water, the tide from the sea prevailed to such a degree that the water of the Thames was salt, so much so that many folks complained of the ale being salt."

A portion of the River of Wells may still be seen by the wanderer on the slopes between Hampstead and Highgate, flowing with tiny current from its only remaining fountain-head in Caen Wood, pure and sparkling, to become, on reaching Kentish-town, a polluted ditch, and then a common sewer, on the remainder of its journey to the Thames. In the long past years this stream, from the hill-slopes to the river, supplied the dwellers on its banks with drinking-water; but its lower portion, even at so remote a date as 1290, was so tainted with impurities that the prior of the House of Carmelites (the Priory of Whitefriars*) complained to the king of the noxious exhalations arising from the Fleet river, which were so abominable that many of the brethren died of miasma, and its fetid odours overpowered the incense burned at their altars. The Fleet river was strangely treated by the civic authorities. In 1343, "for the decency and cleanliness of the city," a lease was granted to the butchers in the parish of St. Nicholas Shambles,† London, of a piece of land in the lane called "Secollane," "near to the water of Flete, for the purpose there, in such water, cleansing the entrails of beasts." In fourteen years afterwards, "for avoiding the filthiness that is increasing in the water, not only of the Fleet, but of the Thames, to the great abomination and damage of the people,‡ it was ordered that

* See *Builder*, vol. xliv., p. 7, "The Priory of Whitefriars," &c.

† The Church of St. Nicholas ad Macellum, or the Shambles (destroyed when Christ Church was made parochial), stood in Pentecost-lane, Newgate-street.

‡ In seven years came the "Pestilence, that so wasted and spoyled the people, that scarce the tenth persons of all sorts were left alive."—Stow's "Annals."

no rubbish or filth should be thrown or put into these rivers, "and if any one shall be found doing to the contrary thereof, let him have the prison for his body." Of Stow's "great water called Oldbourne," little is known beyond what he himself has told: "Oldbourne or Hillbourne, breaking out about the place where the bars do stand, ran down the whole street to Oldbourne bridge and into the River of Wells, or Turnmill brook." There is but little doubt that the Langbourne flowed only in imagination from its fountain-head in Fenchurch-street across Gracechurch-street, down Lombard-street to the west end of St. Mary's Woolnoth, and so on to the Thames; the greater portion of this journey would have been uphill. Excavations in the line of its supposed channel have proved that no such stream ever ran such an erratic course; on the contrary, that Lombard-street was the most crowded district of Roman London, and that neither bridge nor aqueduct was there to testify of any running water. There is strong evidence to show that at an early period a watercourse ran along the present line of Cheapside, and fell into the Wall-brook at Bucklersbury. To quote Maitland's "History of London," "At Bread-street corner, the north-east end, in 1595, one Thomas Tomlinson, causing in the High-street of Cheap a vault to be digged and made, there was found at 15 ft. deep a fair pavement like that above ground, and at the further end at the channel [kennel] was found a tree sawed into five steps, which was to step over some brock running out of the west towards Wallbrook."

Of St. Clement's well, Clerkenwell, and Holywell, mentioned by Fitzstephen in 1177 (?), only the memory remains. Seymour, in 1734, says that in Clement's-lane, running north from the Strand, was to be seen "Clement's Pump or Well." In 1800 a pump erected on the east side of Ray-street, Clerkenwell, represented the famous "Clerken Well" which, a few years ago, finally disappeared. The holy well or fountain, which, together with a part of the moor, were given, previously to the year 1127, to some religious women by Robert FitzGeban, canon of St. Paul's Cathedral, will be vainly sought for in Holywell-lane, Shoreditch. Of the Skinners' Well, where, in 1390, the clerks of the parish churches and divers of the clerks of London performed, for the delectation of Richard II., a sacred play, which lasted three days, not a vestige remains; even its whereabouts is unknown. And a similar fate has befallen the others mentioned by Stow,—Fag's Well, Tode Well, Loder's Well, and Rad Well, whose overflow waters were discharged into the Fleet River,—"the River of Wels."

There were several pools from which supplies of water could be drawn by the citizens. The two principal were the pool in Cripplegate, near the Church of St. Giles, into which, in 1244, Ann of Lodbury (Lothbury) fell and was drowned. After this fatal accident the pool was filled up, but the spring was preserved and enclosed with stone by the executors of the ever-famous Richard Whittington; the other was the Horse Pool in Smithfield, the locality of which is now marked by the enclosed ornamental ground on the south side of the Central Meat Market. Both of these watering-places exist only in books and records.

Over and above these sources of supply, many of the citizens had "fountains" or wells in their curtilages or court-yards and in their gardens. By the Assize of Fitz Alwayne, London's first Mayor, when the houses in the City were constructed entirely of wood, it was enacted, for the prevention of fire, that during the hot months a barrel or large earthen vessel full of water should be kept in front of each house, *unless the house should happen to have a fountain of its own.* These fountains sometimes sprang up inopportunely. In the time of Stow both sides of the street called High Holborn Hill, and the grounds that lay between it and the Thames, so abounded with springs that it was with great difficulty they could be prevented from flooding the houses.

The story of the Great Conduit in Chepe* is the story of the earliest waterworks for the supply of London's citizens. The "Chronicle of London," which was commenced, as Sir Harris Nicolas, its editor, opines, in 1442, records, under date 1284, "Also in this yere the grete conduyt in Chepe was newe begonne to maken." Robert Fabyan, sometime Alderman of Farringdon Without, who died in 1511, writes in his "Chronicles":—"And in this year (1284) the Great Conduit standing against St. Thomas of Acres,* in Chepe, was begun to be made. Stow, who was born in 1525, repeats a similar tale in his "Survey":—"The first cistern of lead castellated with stone in the Citty of London was called the Great Conduit in West Cheape, which was begun to be builded in 1285." All the chroniclers of London City from Stow's time to the present have repeated the same story. The Great Conduit was erected nearly fifty years earlier. It the "French Chronicle" is the following entry:—"This year (1273) came the king and his wife from the Holy Land and were crowned at Westminster on the Sunday next (August 19), and the conduit in Chepe ran all the day with red wine and white wine (*vin vermail et vin blaunk*) to drink for such as wished." On Friday, January 1, 1278, the Chamberlain and Sheriffs of London "were given to understand that one William Le Pannere, pelterer [skinner], was lying dead in the market of West Chepe, near the conduit in the ward of Chepe." The wife of the dead man, the two neighbours who dwelt next to him, "also the two neighbours who lived nearest to the conduit" were attached. So is it recorded in the "Coroner's Roll of our Lord the King."

Careful search has been unable to fix the precise date of the erection of the Great Conduit, but it may be, with much probability, assigned to the middle of the thirteenth century; for in 1236 "the River Fleet, the Wall-brook, and many of the bournes and wells being encroached on by buildings, and otherwise utterly decayed, and the number of citizens mightily increased," King Henry granted to the citizens and their successors, by Gilbert Sandford, liberty to lay a leaden pipe of 6 in. in bore to convey water to the city from six fountains near the town of Tybourne, "for the profit of the City and the good of the whole realm thither repairing; viz., *for the poor to drink and the rich to dress their meals.*" This grant was conferred during the mayoralty of Andrew Bokerell, peperar (grocer).† No mention is made of any other conduit until leave is given in 1390 for the erection of the Little Conduit. So it may be presumed that the Great Conduit, as will be shown in a quotation to follow, was the result of King Henry's grant in 1236. Among those who aided the undertaking were certain merchants of Amiens, Nesle, and Corbie, towns in Picardy, who being solicitous to obtain the privilege of landing and housing certain commodities, purchased the right from the City, on consideration of a yearly payment of 50 marks and a donation of 100*l.* towards the expense of the operations. This liberality was not forgotten. In 1326, when all merchants from foreign lands who had been made freemen of the City had the privilege taken from them, "and the enrolments of the same made in the papers or rolls of the Guildhall cancelled, the merchants of Amias [Amiens], Corbie, and Neele [were] excepted."

Stow says that water was introduced to the Standard in Chepe in 1285, and that the water was supplied from Tyburn; but the true story is that in 1430 John Wells, mayor, grocer, caused the Standard in Chepe to be made, with a small cistern of water, having one cock continually running, when the same was not locked.‡

In 1310 William Hardy made oath before the mayor and aldermen that he would, well and trustily, with the greatest diligence, cause the conduit in Chepe to be kept, so that neither brewers nor fishmongers should waste the water, nor would he sell the water to any one by night or day, on peril of losing his freedom. In spite of this precaution and assurance the water was wasted, and the grievance became so excessive that three citizens, of whom William Hardy was one, were sworn at the Guildhall to recover from the brewers, cooks, and fishmongers certain sums of money for the "easement" they had had from the water of the conduit, which moneys were to be expended on its repair and maintenance. In 1325 the conduit was guarded by locks, and the keys entrusted to three citizens, who were elected masters of the conduit. The masters must have been lax in duty, or the "wasters" become more bold or cunning, for but a few years pass away when the citizens again complain that they cannot be served with water as formerly, because the brewers are at their old tricks again, and send their men daily and nightly to the conduit with tynes,* and make their ale and their malt with the water This complaint resulted in an order being given to the keepers to retain, for the benefit of the conduit, all such tynes that were brought to be filled at it. Before many months elapsed the keepers accounted for 6*l.* 6*s.* 6*d.* received in quit-rents for tynes and tankards that had been impounded, and for 4*l.* and 22 pence laid out in making a clay wall about the head of the conduit at Tyborne, whence the water was conveyed to St. James's-hill, now Constitution hill; thence to the Mews, the King's Falconry at Charing Cross, and on along the Strand and Fleet-street, over Fleet-bridge,† and up Ludgate-hill and Paternoster-row to Chepe. Who shall keep watch over the watchers? Only a week passes after the rendering of these accounts, when Richard of Ghent, one of the keepers, is summoned to answer the commonalty, because that, in rendering his accounts in the Chamber of the Guildhall, he made many concealments of goods and things belonging to the conduit, such as lead, &c.‡ He is fined ten marks, the money to go for the upholding of the conduit. In five days after his trial by jury and verdict, he brings back the lead, which is valued at 49s., and the appraiser receives 23s. 9d. for moneys which he affirms on oath he has expended on the conduit.

No wonder that with such mismanagement the water-supply should become a source of chronic complaint. In 1345 the brewers and others are at their nefarious work again, and again the citizens complain, through the Common Serjeant, "that whereas *of old* a certain conduit was built in the midst of the City of London so that *the rich and middling persons might have water for preparing their food and the poor for their drink*, the brewers, &c." The words in italics are quoted from the grant of Henry III. in 1236, and are applied to the Great Conduit. The expression "whereas of old" must refer to a date antecedent to 1285. The mayor and his brethren of the Corporation are determined to put down the crying evil, and resolve that if any one hereafter *presume* to make ale or malt with the precious water he shall forfeit his tankard or tyne, and pay a fine of 40d.; for the second offence the same forfeit, and a fine of half a mark; the same forfeit for third offence, a fine of 10s., and, furthermore, to be committed to prison at the discretion of the mayor and aldermen.§

It would appear that in 1348-49 some arrangements had been entered into with such persons as used the water of the conduit for other purposes than those laid down in the Royal Grant; for in 1350, on the Thursday after the Feast of St. Martin (rent-day), the masters acknowledge having received for the use of the conduit,—from Cecily Foune for two

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* See *Builder*, vol. xliv., p. 41.

* The Hospital of Thomas of Acres, or Acon, was founded in the reign of Henry II. It was built on the site of the house in which Thomas à Becket was born. Since 1541 the site has been occupied by the mercers as a chapel and hall. The bell of St. Thomas rang Prime, 6 a.m.; that of St. Martin's-le-Grand, Curfew.

† The Bockerels, or Buckerels, an ancient and wealthy City family, had a mansion in Walbrook, the "tenement of Bokerelsberie." Hence Bucklersbury. They were of Italian descent, originally the Boccherilli.

‡ Probably the earliest drinking-fountain in the City. In 630 Edwin, king of Northumberland, ordained cups of brass or iron to be fastened beside the clear wells and fountains by the wayside, "for the refreshing of wayfaring men."

* "Open tubs, holding about four or five pailfuls, and commonly borne by a stang [pole] between two [persons]."—*Cotgrave's Dictionary.*

† There is a sketch of this bridge in J. W. Archer's "Wanderings of 'Zig-zag.'"

‡ The price of a fother of lead,—19½ cwt.,—was 8 marks and 12 pence.

§ These fines represent, respectively, 2*l.* 10*s.*, 5*l.*, and 7*l.* 10*s.* in modern English money.

years, 11s. 8d.; Thomas Beater, two years, 11s. 8d.; Roger, the brewer, at the Maiden in the Hoop (one year empty), 6s. 8d.; John Goby in the Poultry, one year, 6s. 8d.; Roger at the Brook (Wallbrook), for the first year, 6s. 8d.; Dame Cecily, Wrastlyingworthe, for one year, 5s., &c. Among the defaulters for this year,—in the Poultry, John Goby; in Chepe, Roger at the Brook; the assessments varying from 5s. to 6s. 8d. To this list of assessments is subjoined a return of the money, 11*l.* 15s. 4d., received from tankards of persons who are unknown (?), and of the expenses for repairing the fountain-head when it was slandered for poison (esclandre de poyson). This return is interesting on account of the information it affords concerning wages at the time. For bringing the pipe of the conduit into the mews, three men working for three days, each man 8d. per day, 6s.; for ale given to them, 6d. . . For mending and covering the pipe at the fountain-head in the high road, four men for two days, each man 6d., 4s.; paid them 4d. each day for drink, 8d. The sums allowed for drink-money seem excessive, as the best ale was sold for 1½d., and the small ale for 1d. per gallon. "For hire of a man and his cart for two days, at 2s. per day, 4s." Much employment seems to have been had for carts in those days; indeed, so important were they that they were legislated for in an Act of Edward I., whereby to prevent streets and roads being unnecessarily cut up by carts, it was ordered that no cart serving the City with wood, sand, or stone, should be shod with iron,—that is, have iron strakes or rims on the wheels. The water supplied to the citizens from the Thames was carted at certain specified rates. For a cart carrying water from Dowgate or Castle Baynard to Chepe, 1½d.; if beyond, 2d.; if not so far, 1¼d., and, well worthy of remark, all carts when unloaded were, for the safety of the public, to be driven no faster through the City than when laden. In the same reign it was proclaimed "that the gallon of conduit-water weighs ten pounds four shillings by the ordinary weight, and the gallon of Thames water ten pounds sixteen pence by the same weight."*

As the years went on the misdoings of the brewers and others increased, until they reached a climax. In 1415 complaint is made to the authorities that the brewers next to the Great Conduit in Chepe, and others, have rented the fountains, and the great upper pipe of the conduit, and are drawing water for their brewing out of the small pipes below. The "renders" are ordered not to draw from the same pipes under a penalty of 6s. 8d. for each offence. In 404 a fine of a pound of gold was imposed for every ounce of water taken away surreptitiously from the public fountains of Constantinople.

Pipes were as liable to burst then as now. In 1388 the good men of the neighbourhood of Fleet-street complained to the City authorities that very many losses and grievances had oftentimes befallen them through inundations from "the London acqueduct," the name given to the pipes which conducted the water from Tyburn to the Great Conduit, and further stated that these inundations rotted and damaged their houses and cellars and the party-walls† thereof, as also their goods and wares. The good men were granted the great privilege of erecting, at their own cost, a pent-house (pinnaculum) over the aqueduct, which perhaps may have been exposed, for the pipes were in some places above ground, as may be seen by the occasional disbursements of money for "mending and covering the pipe." This pent-house was erected opposite the house and tavern of John Walworth, vintner, near to the hostel of the Bishop of Salisbury, which stood on the site of the present Salisbury-court, Fleet-street.

In 1390 the substantial men of the ward of "Fardone" Within, and other citizens, intended, at their own cost, to build a conduit near to the Church of St. Michael le Quern to be supplied by the great pipe of the conduit opposite to St. Thomas of Acon, and leave was granted to the reputable men so to do, provided that the work should not be injurious to the Great Conduit. In Wilkinson's "London before the Fire" a view is given of the church and "ye lytle cundit," as they appeared in 1585. In this view three pipes are represented coming from Paternoster-row; one enters the conduit, two pass along Cheapside, and of these, one diverges to the north opposite Foster-lane, and one passes on in the direction of the Great Conduit. Fourteen flagons or tankards are ranged in front of the Little Conduit.

The first enterprising Londoner who introduced conduit water to his premises was a tradesman of Fleet-street. In a record of 1478, it is mentioned that "a wex-chandler in Flete-strete had bi crafte perced a pipe of the condit withynne the ground, and so conveied the water into his selar; wherefore he was judged to ride through the citie with a condit uppon his hedde," and the City Crier was to walk before him proclaiming his offence.

John Lydgate wrote two long poems to celebrate the return of Henry V. from his victory at Agincourt in 1415. In one he sings:—

> "Men and women, for joye they alle
> Of his comyn thei weren so fain,
> That the Condyds both grete and smalle
> Ran wyn ich one as y herede sayn."

After serving the City for upwards of two centuries, the Great Conduit began to show symptoms of decay, and was taken down and rebuilt in 1479. Long before this date many conduits, fed from other fountain-heads than the springs at Tyburn, had arisen in various parts of the City and suburbs, but the conduit "opposite to St. Thomas of Acon" was still the *Great* Conduit. For centuries it had, on the occasions when the City held high festival, poured forth wine, red and white, for all comers and had listened to the "noise of musick" and addresses full of loyalty and bombast, and had been "beautified with pictures and sentences." Its last appearance in Court dress was in 1662, when King Charles entered London. On the top of the Great Conduit at the entrance of Cheap was another fountain, out of which issued both wine and water, as in representation of Temperance, and on the several towers of that conduit were eight figures," &c. So writes John Ogilby.

The Great Conduit perished in the Fire. Samuel Rolle "commented and improved" on the Burning of 1666 in "CX. discourses." In one of these he speaks in tones of lament,—"Methinks the several conduits that were in London stood like so many little (but strong) forts, to confront and give check to that great enemy, Fire, if any occasion should be. . . . . What a pity it is to see those breasts of London (for so I may also call them) almost dryed up. They were lovely streams indeed which did refresh that noble city, one of which was always at work pouring out itself when the rest lay still. As if the Fire had been angry with the poor old tankard-bearers, both men and women, for propagating that element which was contrary to it, and carrying it upon their shoulders as it were in state and triumph; it hath even destroyed their trade, and threatened to make them perish by fire who had wont to live by water."

With the destruction of the Great Conduit, which was not rebuilt after the Fire, its story ends.

The Association of Municipal and Sanitary Engineers and Surveyors.—A home counties' district meeting will be held at Brighton on Saturday, the 15th inst., when, after the transaction of other business, the following paper will be discussed,—"The Supervision of Private Buildings by Public Authority," by Mr. Ellice-Clark. The following Paper will be read and discussed:—"Jointing Sewer Pipes," by Mr. H. P. Boulnois, Borough Engineer, Portsmouth. The members will afterwards proceed to view the Sea Defence Works at Hove and Brighton, now in progress; also the Brighton Intercepting Sewer Ventilating Furnace.

STUDENTS' DESIGNS AT THE INSTITUTE.

THE drawings sent in competition for the Soane Medallion, the Tite Prize, and the Institute Silver Medal, which have been hung in the rooms of the Institute during part of this week, are, on the whole, above the average of merit. The names of the prize-winners are given categorically elsewhere. It is noticeable that among the eight who have obtained recognition, four are provincial men,—a fact which seems to indicate that students residing in the provinces are not, after all, so disadvantageously placed in comparison with those in London, as has sometimes been suggested.

The subject of the Soane Medallion was a Theological College; and, considering the usual association of Gothic architecture with the Church, it is not surprising that all the competitors, except one, have chosen to be more or less Gothic in style. The design by MR J. O. Harris, which has obtained the first place, unquestionably deserves its position as far as design and drawing are concerned. The author has adopted a Late Gothic style, English in feeling, and suggestive in its general features, especially in the turreted gateway, of what Oxford and Cambridge have led us to think of as specially associated with collegiate architecture. The general perspective makes an effective group, and is a fine drawing; the tower, which is inevitable in all competition designs, is got in so as to have some relation of proximity with the chapel, and consequently a certain meaning in the design; it is somewhat more prominent and elaborate than is called for in this class of building, the expression of which should be semi-domestic. The author would have done better with his library windows, which are prominent external features, if he had not run them quite up to the cornice mould nor spoiled their scale by the big leaves in the spandrels. The plan is by no means equal to the design, and is, in fact, very faulty. It is on the continuous corridor principle, surrounding a quadrangle, but the space is merely cut up into so many rooms with no consideration of how to make the most of the space. The studies are mostly long, narrow rooms, with a window at one end, the worst form of room for regular study, so far as lighting is concerned; the infirmary is placed so as to command the noise and draughts of two corridors, and with a water-closet opening out of it, without any intervening lobby; indeed, these conveniences crop up everywhere, in the most random and unprincipled fashion. The author has almost the rudiments of planning to learn yet. The design which receives a medal of merit, by Mr. H. O. Cresswell, is a much better plan, and the design, though somewhat commonplace in detail, perhaps owes some of its less attractive effect to a rather heavy style of drawing and colouring; certainly there is far less artistic feeling in the drawing; a less capable hand; but the building looks like what it is meant for, and the chapel is successfully emphasised. The designer of "Marguerite" seems to have been inspired by admiration for the Law Courts and their tower, mingled with a hankering after some of Mr. Norman Shaw's detail; there is a certain force about the design, which is tinted, showing red brick and stone dressings after the prevalent fashion; the ponderous tower is, however, not only out of keeping with collegiate feeling, but marks nothing on the plan except the porter's lodge. A tower should mean something. The plan is arranged on the system common in the Cambridge colleges, with a separate staircase to each breadth of dwellings, instead of continuous corridor communication: an old-fashioned arrangement which, entailing some little inconvenience in moving about, unquestionably keeps a college quieter, more secluded, and more domestic in character than the corridor system. Of the others, the one which shows most sense of the kind of thing wanted, as far as architectural expression is concerned, is "Vera" (the names of the successful authors only are divulged), which is a quiet and semi-domestic building

* The shilling of silver weighed three-fifths of an ounce; the silver penny, thirty-two grains of corn from the middle of the ear.

† By Fitz Alwayn's Assize, perhaps the earliest English Building Act; for the prevention of fire, party-walls were ordered to be built of free-stone, 3 ft. thick and 16 ft. high.

that could not be taken for anything but a college, not unpicturesque in grouping, though weakly drawn; the plan is youthful and impossible. "Ars longa, vita brevis" is a motto which seems to put forward a pathetic excuse for the extraordinary, and in some places, nearly unintelligible pen-and-ink scribble in which a bird's-eye perspective is shown; the author would have gladly done it in a more finished and intelligible manner; but "vita brevis,"—life is *so* short! "St. George" shows a careful drawing of a heavy type of Gothic; "Stone" is a Classic building ably drawn, but in very unrefined taste, and with absurd deficiency of window space; "Detur digniori," with nothing special in plan, may be commended for a rather picturesque and effectively treated perspective.

While the suggestions of the subject have thus taken the Soane competitors mostly in the direction of a kind of miniature Gothic revival, the Tite prize, specially intended to encourage the study of "Italian architecture," has also met with an unusually large response; a fact indicating the changed state of architectural feeling among the rising generation of architects, since it was difficult, some little time ago, to obtain any adequate competition for this prize. What was really Sir William Tite's object in the bequest? What did he intend that the competitors should aim at? We suspect his views did not go much further than a conservative desire to fix the attention of students on the style which was accepted in his own younger days as the correct thing, and to stem the tide of Gothic fashion. It is possible, however, to take a larger view than this of the study of Italian architecture; to regard it as the opportunity for developing some of the latent resources of that school of grandiose and stately building which grew up when the Italy of the Renaissance began to fashion the materials of old Rome into a new phase of architecture expressive of the refined and sumptuous, though by no means very earnest, social and artistic spirit of that day. What they did with Roman materials we in turn might strive to do with their materials; and however we may be fascinated, and our imagination kindled, by the romance and aspiration of the Gothic school of architecture, there is no doubt that the school of architecture called, for want of a better name, Italian, is, of all schools that have existed, the one specially expressive of the feelings and tastes of a refined and cultured civilisation; one which keeps the balance between intellectual and social claims. It is not spiritual architecture, certainly; it is not even *spirituel;* but it is eminently the architecture of reason and refinement. Somehow or other the idea of the "hall and staircase of a royal palace" (which was the subject given for the Tite prize) at once suggests to most of us the idea of Classic columns and capitals, of Classic dignity and symmetry, even if the style had not been defined by the conditions in this case. Of the designs sent in by the students for this very interesting and suggestive subject, in which one may be allowed any amount of richness and costliness of treatment irrespective of expense, two are decidedly before all the rest in execution, and one in idea; but that is not the one to which the prize has been given. We understand that the decision of the Council in the matter has been a good deal questioned already. It is more than a question; there is no doubt whatever that a mistake has been made. The drawings of Mr. Poley, to which the prize has been awarded, are beautifully finished; the perspective view of the whole, drawn carefully in line with no adventitious aids of shading, is an admirable specimen of clear clean drawing. But this draughtsmanship is expended on a design of little originality, and which would be effective in execution from its size and richness of detail rather than from any special qualities of design as a whole. Mr. Campbell's design, to which the medal of merit has been awarded, is, on the other hand, really an arrangement of considerable effectiveness and originality; it is not like any cortile staircase, with columns and a gallery round it; there is considerable ingenuity in the arrangement of the stairs, and very fine effect in the circular sweep of the hall at the back, with its order of Corinthian columns. It might be thought by some that there is more grandiose effect in the simpler design; but it represents what has been done or drawn so often, whereas in the design placed second there is real originality of a very effective kind. We cannot understand the award at all. Of the other drawings for this prize we cannot say much; in the grateful gloom of the "arbitration room" there was hardly light enough to arbitrate on the drawings that were not near the window; we noticed one entitled "Art," in the Adam style, not without effect, but giving the idea more of a ball-room staircase, a kind of "Almack's," than of a grand palatial entrance; and we do not suppose that Sir W. Tite meant Adam, when he spoke of the "Italian style." He was reverting to "pre-Adamite" days. There is a *cachet* about the style of the Adams, unquestionably; but it is of a light and frivolous order, compared with the dignity and stateliness of the Italian style as it took shape in the Rome, the Florence, and the Venice of the great Renaissance epoch.

The measured drawings from existing buildings, for the Institute Silver Medal and Ten Guineas, are excellent. The first prize has been gained by Mr. Anderson for a very complete and highly-finished set of drawings of Elgin Cathedral; the second by Mr. A. W. Wilson, for an almost equally good set from Walton Church, Norfolk, with its picturesque tower standing apart at the entrance to the churchyard. Among the unawarded, "Spes" sends a good set of drawings of St. Leonard's, Middleton, Lancashire, a long low church, with a wooden upper stage on its squat tower; the perspective sketch is bold and effective in style. It is, however, much easier work, takes less out of a man (and, consequently, gives less indication of what is in him), to do even elaborate measured drawings than to produce an original design; and, except for permanent publication, it is possible to over-rate the value of this patient elaboration of measuring and sketching, which is like the eternal stippling in certain schools of art. We would rather have seen a good set of competitors for the Grissell Medal, for which there was no competition at all, than for this measuring and sketching work. We want architects to be builders, not mere draughtsmen; and the neglect of the Grissell Medal, which involves practical constructive work, as well as the decided superiority of drawing over plan in the Soane competition, shows that the tendency is not sufficiently in this direction.

NOTES.

THE frequent attacks upon the late Mr. Street's great work appear to bring up but few apologists. There is, perhaps, much which does not admit of apology; but it is only fair that he should not be condemned in matters wherein he was not blameworthy. To take the court fittings, about which there was another grumble in Parliament a few days ago. Before designing these Mr. Street visited every approved court in the kingdom, and measured and sketched its fittings, taking evidence from those who used and approved them. Upon this information he based his designs, which were submitted to a committee, including the Lord Chancellor, the Judges, and delegates from the Incorporated Law Society. Whether they understood the elaborate technical drawings laid before them may be questioned. But they were unanimous in condemnation of the design, whereupon two of the courts were fitted up experimentally in deal with seats and desks arranged to suit the views of the learned committee, and the courts so fitted up were approved by them and thereupon copied in wainscot. No sooner were they completed than they were found to be unsuitable, and Mr. Street was most unjustly blamed for the fiasco. An attempt was then made to revert to Mr. Street's original design; and a sort of hybrid scheme is the result,—satisfactory to no one; and those who are really responsible for the failure stand aside and allow the unfortunate architect's name to be execrated for the sins of other people. We have never been among the admirers of the building as a whole, though appreciating fully its admirable points of architectural detail, in which the spirit of Mediæval work is so well reproduced. But if the above be, as we are assured, the true story in regard to the fittings, it is at least only common justice to Mr. Street, who can no longer defend himself, that the blame should not be laid on him for a matter in which his own intentions were traversed.

THE question of cross-river communication was before the House of Commons on Wednesday last, when, on the second reading of the "Metropolitan Board of Works (Thames Crossings) Bill," Mr. Ritchie moved that the Bill be referred to a select committee, five to be nominated by the House and four by the committee of selection. In the course of a discussion, in which the amendment was supported by Mr. Firth, Mr. Raikes, Mr. Bryce, Sir C. Dilke, and Sir R. Cross, a very general feeling seems to have been indicated that the Metropolitan Board of Works did not sufficiently represent all the interests connected with the subject to be left without the more full and special investigation for which such a committee would afford opportunity. Mr. Ritchie criticised the proposal for the subway or tunnel on the ground that its site was much too far west to prove a real advantage, and that the heavy gradients of approach would prove a serious drawback to its usefulness; a point on which we have already commented to the same effect. The amendment, which was opposed only by Sir J. M'Garel Hogg and Baron H. de Worms, was agreed to. There will thus be some likelihood that the conditions of this important scheme will be fairly and fully considered before anything decisive is resolved upon, or any money possibly thrown away. The scheme was alluded to by Mr. Ritchie as one for providing a tunnel and various ferries conjointly. We again urge that the ferries be tried first.

IF what we hear be true, that there is a movement among some members of the profession, who are dissatisfied with the present condition of the Institute of Architects as their representative body, to secede and form a professional society of their own, we can only say that such members are meditating a very unwise and what may be called, in the broad sense of the word, a very unpatriotic course. The part of those who complain of deficiencies in the representative body at present ought to be, to come forward and do their best towards assisting to render that body what they think it should or might be. Any other course is suicidal as regards the practical and material interests of the architectural profession. The Institute possesses the respectable basis of a Royal Charter (a matter not without its influence on outside opinion), and a really very well constituted, and, on the whole, well-worked machinery for action in matters which concern professional interests. What is really wanted is that it should pay the same attention to the first provision of the Charter, that it should act "for the advancement of the art of architecture," which it pays to the consideration of material and business interests. The very people, members and non-members, who could do most in furthering the former object, stand apart with their hands in their pockets and pose as mere critics. If they would take the less easy but more useful and honourable *rôles* of leaders and helpers, the Institute might soon be in a position to defy the sneers of those who, sometimes not altogether unjustly, regard it as a professional "Trade-Union."

ACCORDING to a published report by Mr. Carpenter on the state of Sherborne Abbey tower, this erection is in a state of disintegration which will call for very extensive repairs, without loss of time. The whole of the east face it is proposed to rebuild from the back of the relieving-arch over the choir-arch; and, judging from the appearance of the tower when we last saw it, no less thorough "restoration" could be effective. The *Times*, we observe,

innocently compliments the architect on his "ingenious conception" of an iron girder with springers, by which all thrust from the arch will be obviated, which is apparently regarded as a new invention not before heard of. Messrs. Warner have recommended that when the bells are re-hung, after the restoration, the great tenor bell given by Wolsey should be omitted from the peal. This would be a great pity, and would take from the peal its almost unique character among the swinging peals of England. We should have hoped that architect and bell-founders between them could have provided for Wolsey's bell to swing in safety.

FROM a communication sent to us from the Office of Works, too late for publication last week, we learned what has already been published in some of the daily papers, that the Chancellor of the Exchequer, the First Commissioner of Works, the Right Hon. W. H. Smith, M.P., Mr. Philip C. Hardwick, and Mr. Ewan Christian, have been appointed by the Government to act as judges in the competition for the new Admiralty and War Office. The designs for this competition were to be delivered before noon last Saturday. We have pleasure in expressing our approval of, and confidence in, the committee thus selected, in which the profession of architecture is represented by two members thereof whose competency to form a fair judgment on the designs submitted will not, we think, be questioned.

WE are glad to see that an effort is being made to secure the disused burial-ground of St. John's, Westminster, as a recreation-ground for the inhabitants of a very crowded neighbourhood. A faculty has been granted by the Consistory Court for this purpose, and the Duke of Westminster has contributed 1,000*l.* towards the formation of the garden. In an article on "A Sketch of the Future of Westminster" some years ago (*Builder*, Sept. 21, 1878), we called attention to the capabilities of this wasted piece of ground, and suggested its formation into a garden. Perhaps we may hope to see some of the other suggestions contained in our plan of that date carried out, sooner or later.

IT is understood that a proposition has been made that the drawings sent in by students for the R.I.B.A. prizes should in future be regarded as the property of the Institute, and the right of publication be denied to their authors. We should hardly expect that such a course would be favourable to the promotion of active competition among the students of the future, to whom the publicity of their designs, when successful, is obviously a matter of considerable interest. The same policy of suppression was tried some time since in regard to the papers read at the Institute. One result was that one or two of the foremost men in their ranks declared their intention of not contributing again to the Transactions until this bar to real publicity was removed.

ELSEWHERE we print the substance of a circular from the Science and Art Department in reference to a proposed exhibition of the work of students of the schools of art in the kingdom since 1862. Thus we shall have, parallel with the Health Exhibition, which will show us how our bodies are being cared for, another exhibition which will afford a comprehensive means of judging of the results of the art-teaching of the last twenty-one years as directed by the Government schools. This will be a matter of considerable interest, and one which is likely to give occasion to a good deal of variety of criticism. If, as we gather, rewards or prizes are to be given in connexion with this general exhibition, we hope the Department will be a little more reserved in this matter than they usually are in their annual distributions, and not destroy the value and meaning of rewards for merit by scattering them broadcast.

FROM a report in a Birmingham paper it appears that Mr. William Morris prefaced the first of two lectures at the Midland Institute, on "The Gothic Revival," by describing that revival as an attempt to break down the slavery first imposed upon us by the Italian Renaissance, and said that any attack, however feeble and from whatever side directed, to break down "such a monstrous and cowardly tyranny," was worthy of attention and sympathy. If Mr. Morris is so one-sided and so bigoted as to see no more than this in Renaissance art, we should hope, at least from what we remember of the temper and perception of the Birmingham and Midland audiences, that his hearers had common sense enough to repudiate his convictions. If Mr. Morris would confine himself to artistic design, in which he has shown such exquisite talent, and avoid social and artistic criticisms, he would do better for his own repute than by posing as a prophet and crying out in deprecation of every form of art or society except that which happens to fall in with his own perceptions.

WE have received a rather eccentric circular bearing the signature of Mr. A. H. Mackmurdo, announcing the forthcoming appearance of a new periodical, to be called *The Century Guild Hobby-horse*, and to deal with art and letters. The new journal is not to be "a creature of commerce, made for a market, cried at the corners":

> "Instead of padding and pilfering under the disguise of domino, to bring up letter-press to requisite weight by the first of each month, our relation to readers and writers allows us to depend upon an extension of time for the make-weight of matter, and upon gift of contribution for sincerity of conviction."

Done into English, this means, we presume, that the journal cannot be depended upon to appear at any particular date, and will not pay its contributors. We should really suggest to Mr. Mackmurdo that one of the qualifications for literary work is the faculty of writing idiomatic and intelligible English, and that the definite article is an integral portion of the language. However, as Sir Hugh Evan says, "his meaning is goot." One of the subjects promised is a synthetic history of pictorial art, illustrated by the contents of the National Gallery.

IN reference to a proposal to place a monument to Lord Frederick Cavendish in the neighbourhood of Bolton Abbey, some gentlemen, who ought to know better, have addressed an exceedingly foolish letter to the committee to complain that the whole scenery, *genius loci*, and what not, of the landscape would be spoiled by such an addition. The design for the monument, by Mr. Worthington, we have not seen, but if it is good in itself, it will certainly not spoil the landscape. The objectors had better study the combinations of architecture and landscape to be found in the works of Claude and Gaspar Poussin, and learn a little more about the subject than they seem to know at present.

CALCULATING SCALES.

WE have received a small pamphlet on calculating scales for ascertaining at a glance the proper thickness of retaining walls, which has an interest, apart from its technical use, as being the work of an Indian Associate of the Institution of Civil Engineers, Lala Ganga Ram, formerly an engineer of the Public Works Department in India, who puts on the title-page of his little work the certificate from Major Alan Cunningham, of the Royal Engineers, and late Professor of Applied Mechanics, Rankee College:—"Your scales are very ingenious and very handy for those who have such work to do."

It is a remarkable fact that the great advance which has been made within the few past years in the use of graphic methods of design has not been accompanied by a corresponding activity in what bears almost the same relation to the drawing-board that dynamical bears to statical science, viz., the construction and use of sliding scales. We have hunted in vain through not a few mechanical books for a good account of either the English or the French slide-rule, valuable as these instruments are to those who are familiar with their use. Knight's "Practical Dictionary of Mechanics," which is a very reliable book as far as it goes, though deficient in scientific information, simply says:—"Some rules have a slide in one leg," which is not very instructive. Perry's "Practical Mechanics," published last year, is one of the latest works which has come through our hands, in which some clear account of these useful instruments ought to be found. But Mr. Perry merely remarks, in the page to which the word "slide rule" in the index refers, "how few workmen know how to divide or multiply numbers, to square or extract roots, by means of the slide rule! How few educated engineers, even, are able to make use of it! The owner of the instrument-shop in which it is sold is seldom able to explain its use. It is known that very complicated problems can be worked out on it, but it is also known that to learn the working of these would require more time than it is worth while to devote to them, and, besides, they would be readily forgotten, whereas it is not sufficiently well known that the really useful processes of the slide-rule can be taught to any man in a few minutes." Here, unfortunately, the subject is dropped. The remarks as to a complicated process would apply with about equal force to the study of algebra,—if not to that of Euclid himself,—who, by the bye, is signally slighted by many modern professors. But we look in vain even for the few words that should explain the "really useful processes." In Shelton's "Mechanics' Guide," a book written by a working man for working men, we find a chapter headed "instrumental arithmetic, or utility of the slide rule," which gives rules and examples for multiplication, division, rule of three, involution and evolution by the English slide-rule, but which makes no attempt to explain the theory of the instrument. The French slide-rule, of which we have one signed Gravet Lenoir, 14, Rue Cassette, Paris, is a very elegant instrument, in which the divisions are set out on the principle of a logarithmic curve, and on the back of which is a series of very useful equivalents. There is, we believe, an explanatory treatise, but we have it not at hand. A sort of hybrid between the scale proper, or such an old friend as the 2-foot rule, and a slide-rule, is the ingenious scale of Gunter, generally used for plotting the chains and links of the land surveyor. In this, as is well known, great accuracy of measurement is attainable with few vertical lines, by the introduction of sloping lines, and of the method of taking the distance by dividers from the part of the scale that gives the nearest indication of the length sought.

We may note, as essentially of the same class of appliances as the scale of which we now speak, the diagrams given by Mr. Jackson, in his translation of Kutter's work on the discharge of rivers and canals, for obtaining the value of any one of the four quantities used in such calculations when the other three are given. In this the elements are so arranged on paper that by laying a straight-edge from point to point the required answer will be found. This, it will be seen, is an approach to a calculating-scale.

The object of the calculating-scale mentioned at the head of the present notice is to arrive readily at the proper thickness of retaining walls by simple inspection. The author premises that a retaining wall has to be designed to meet the requirements of stability, safety, and adequate foundation. That is to say, it must be of sufficient weight not to heel over, or, in other words, the resultant pressure must not fall outside the base; the greatest force of pressure must not approach the crushing strength of the materials used, with a proper allowance for margin, and the pressure on the foundation must not exceed the resisting capacity of the area of the same. As to the last, a wide experience and a careful observation of each case when the wall has to be erected is required, and we have very strong doubts how far the work of the engineer in this respect can be facilitated by any mechanical calculator. As to the other points, the opinion of Major Cunningham as to the utility of the scales will have great weight with those who are aware of the claims of that officer to be regarded as an authority on the subject. Major Cunningham's hydraulic experiments are among the most careful and detailed of any to be found in the English language. For the mode in which the scale is to be used, we refer to the little pamphlet, which is published by E. Tann, 75, Chancery-

lane. The author has not given any account of the principle on which the scale has been constructed, although he gives a drawing of one of these implements, as well as rules for its use. He also gives comparative examples of results obtained by the scale, and of those arrived at by accepted formulæ, which are closely accordant. The work is worthy of the serious attention of engineers and architects.

A second scale is prepared, by the same engineer, for calculating the scantlings of beams and joists, and the strains on trusses. We are also promised scales for strains on girders,—whether plate, flanged, latticed, or of any other shape,—by which the bending and shearing strains at any point are to be found at a glance. We can only repeat that the advance in graphical methods of design is such as not only to facilitate, but even to demand, a great development in the construction of various forms of slide-rule, and that Lala Ganga Ram has the credit of having been among the first to give a practical answer to this new demand on the ingenuity of the engineer.

MR. POYNTER, R.A., ON EGYPTIAN SCULPTURE.*

I HAVE been invited to lecture to you on Sculpture,—an art of which I have no practical knowledge; it is therefore with the greatest diffidence that I address you, for two reasons; first, because, having no practical knowledge of the art, I can be of no use to those students who come here to study in the modelling school; I can give you no hints as to methods of procedure from my own experience; and secondly, because, not being able to lecture to you from this point of view, I am obliged to fall back on the literary and historical side of the subject, in which again there are many who are far more competent to give you trustworthy information than myself.

You have just had the inestimable advantage of two lectures from Mr. Newton, lectures at which you may be sure I was present, and to which I listened with the greatest attention. Had I known, when the honour of giving these lectures was proposed to me, that Mr. Newton had already been persuaded to enlighten you from the vast stores of his learning and experience, I should have thought twice about undertaking a similar task, for in a subject like that of the history of antique art, on which I intend to address you, it is only with the crumbs of information picked up from the results of the labours of those who, like Mr. Newton, give their lives to the study, that I can venture to come before you. Where the field of research is so large, and details are so infinite, the most ordinary accuracy is a matter of difficulty. I have chosen antique sculpture for my subject, because, in the first place, the art of the Greeks is not only in itself the greatest and the most complete which the world has produced, but is also the base on which all the higher forms of art are founded; and also because the absorbing interest of what was done by the ancient nations of the world seems, when once the mind has fully entered into it, to preclude attention, for the time at least, to all other. To the mind which has taken in the surpassing perfection of Greek sculpture, there seems to be room for nothing that comes after it. Even the works of that great Florentine of the Renaissance, with all their originality, splendour of design and elevation of thought and style, seem then to sink into a second place; the element of freshness and exuberance of life which underlies even the lighter forms of Greek art,—the element of unconsciousness especially,—is wanting, and we feel that we are in the presence of something sophisticated, which is the necessary result of art having entered a second stage of the world's history.

My attempt in the direction of an historical outline may, however, be the right one, for a lecture on sculpture in this place should not be for the advantage of the students of modelling only, but should be for the use of all, the study of typical works of sculpture being not without advantage to the student of architecture, while to the painter it is indispensable, not only for the purpose for which you, gentlemen, follow the course of study, too familiar to you, you may think, under the name of "Drawing from the Antique"; but for the purpose of improving and simplifying style, especially in the higher forms of decorative design, the study of sculpture is of the very highest importance. It is, perhaps, the secret of Michelangelo's overwhelming superiority in monumental painting that he was by profession a sculptor. The very ground on which he excused himself (that painting was not his art) from undertaking the decoration of the Sistine Chapel was the basis of his exceptional success. It was the knowledge of the conditions which are an absolute necessity in sculpture which enabled him to concentrate his power on those painted figures which are so vivid in their reality that they seem almost endowed with life and motion. But, independently of this object, any help towards the understanding and appreciation of great styles of art cannot but have an inspiriting effect on the student, which, in whatever direction in the walks of art his individual bent may lead him, must necessarily be so much to the good in the future practice of all; while it should have the effect of leading some to an attempt at emulating the highest efforts of human genius. A proper appreciation of a style and period of art is very much assisted by a knowledge of its history. Mr. Newton told you how necessary it is for the archæologist to keep his mind constantly exercised in comparing one work with another, and one style with another, that he may have a clear idea of the place it should occupy in the development of the various schools and styles. A knowledge of this kind cannot be without advantage to the artist also. The habit of comparison is a necessary process to aid us in formulating our critical perceptions, that is, in increasing our faculty of judgment and our sensibility to beauty, which are, as Burke says, "the qualities which compose what is called a taste." In giving you, therefore, such an outline of the history of antique sculpture as I am competent to do, I shall hope to interest you sufficiently to tempt you to pursue the subject on your own account. Nor is the material wanting. In the early days of this Academy as an institution there were scarcely any works on the subject to which the student could turn; such as there were, indeed, were founded on hypotheses long ago held to be untenable. Now every year sees some popular work published, accessible for reference to every student, and containing every year more complete information as investigation and discovery open up fresh fields of knowledge. With such histories it is not only impossible, but unnecessary for me to compete. I shall attempt, therefore, as I have said, to give you only an outline, and that in a somewhat discursive manner, giving you from time to time the result of my own impressions as an artist, which in archæological matters you must take for what it is worth, and illustrating them by referring you whenever possible to the British Museum, and to works with which you are acquainted. And here I may mention the invaluable assistance which will shortly be afforded to all of you in the Museum of Casts which will before long be opened at South Kensington. This museum is due, in the first place, to the energy and persistence with which Mr. Walter Perry worried the authorities until he obtained a grant of money with which it could be started,—on a small scale, it is true, compared with what is done abroad in most towns of importance, but still on a scale sufficient to put the student in possession of the leading facts in the history of art. That the thing was ultimately done is due to the enlightened interest taken in the matter by Lord Spencer when he was President of Council, and consequently at the head of the Science and Art Department. To the casts in this museum I shall also, no doubt, have ultimately to direct your attention, especially in dealing with the earlier development of Greek art. To this point I propose to lead up by a short account of Egyptian and Assyrian art, and the ways in which they may have affected the origins of Greek sculpture. The times are, doubtless, very much changed since those early days when Flaxman delivered his lectures on sculpture. You have heard from Mr. Newton of the vast and valuable discoveries which have been made since that time. But another world has been brought to light which did not come within the scope of Mr. Newton's survey, a world of which neither Flaxman nor any one else of his time suspected the existence. Nineveh, although its destruction by the Medes and Babylonians was not so complete and final as the Prophet Nahum and the Jews had hoped, and as the Greeks believed it to be when Sardanapalus, the last of their independent kings, burned himself and his palace together,—for it subsisted for some time after this event,—had yet so completely perished in historical times, that its precise situation seems to have been unknown, if not to Herodotus, at least to the later Classical authors; and so it remained for 2,300 years, until Botta, the French consul at Mosúl, after burrowing in vain under the village of Koyundjik, and finding nothing but fragments of reliefs and undecipherable inscriptions, made one further discouraged attempt in the mound at Khorsabad, and plunged at once into the heart of the most perfectly preserved part of Sargon's palace; the most brilliant discovery, perhaps, of modern times, which was so brilliantly followed up to the great benefit of our museums by Mr., now Sir Henry, Layard. Flaxman little suspected that under those heaps of mud, rather than in Egypt, was to be found the origin of Greek art, or, rather, of the form with which Greek art first invested itself. With Egyptian art he was, to a limited extent, acquainted, and he devoted one of his lectures to the subject; but he was, like every one else at that time, in complete confusion regarding the history and dates of the works he refers to, for the Egyptian writing was then a sealed book to all the world; and it is only since the deciphering of the hieroglyphs has enabled us to read the inscriptions and the names of the Egyptian kings that it has been possible to form a connected history of the country and so of its art, for the name of the reigning king was constantly affixed to works of art, and when this is so, their relative chronological position, if not the actual date, can, in the present state of Egyptology, be ascertained with approximate, and sometimes with absolute, accuracy. You will find that Flaxman ascribes most of their great works to "Sesostris and afterwards," fixing the date of this king at about 1,000 years before the Christian era; and he adds the curious remark that the arts of Egypt and Greece were then in a state of progressive improvement at the same time. Now Sesostris, as I have no doubt you are aware, is a legendary personage of Greek invention, or, rather, of late Egyptian invention; for when Herodotus obtained his information from the priests at Memphis, the great Theban dynasties had been extinct for nearly 700 years, and the exploits of Sesostris are made up of those of many celebrated Pharaohs rolled into one. The king with whom Sesostris is most identified was Rameses II., or the Great, who lived about 1,350 years before the Christian era, and it was in the early part of his reign, no doubt, that, not only as regards the magnificence and the profusion of the works produced, but also as regards elegance of proportion, and, in some respects, beauty of style, Egyptian sculpture reached its culminating point, from which during his reign, though production did not cease, it fell rapidly in merit. But the earliest existing work of Greek sculpture, the Lion Gate of Mycenæ, is not placed earlier than the beginning of the eighth century B.C.,—500 years later than the death of Rameses; which shows us how wide of the mark Flaxman was in making the arts of Egypt and Greece march hand-in-hand. Flaxman, however, was not the man to under-estimate the great qualities of the art of the Egyptians, and in his measured language he says that "in Egyptian sculpture we shall find some excellent first principles of art"; and it was probably this perception which led him to consider it at least in sympathy with the Greek; for he does not make it clear whether he supposed Greek art to have influenced that of Egypt, or the reverse; and another remark of his, to the effect that the rudest works are the earliest, shows the state of criticism at that time, and how readily people jumped to what appeared to be a natural conclusion,—a fault from which we are not all of us free, even in the present advanced state of critical methods of examination. For we now know, it may be said with certainty,—unless, indeed, the most distinguished Egyptologists are on a false track,—that, although there was a development of ideal treatment towards elegance and symmetry, to the culmination of the art in the nineteenth dynasty, the sculptors of the Old Empire,—that is, of the early third, fourth, fifth, and sixth dynasties, which reigned at Memphis,—greatly excelled that of the Theban in its truth to nature and its rendering of character, the process being precisely the

* A lecture delivered at the Royal Academy on Monday evening last.

reverse of that which usually takes place in the course of the artistic development of a nation. The earliest specimen of Egyptian sculpture that we know is of a kind of which numerous specimens have been found in Lower Egypt, and a woodcut of it is given in Messrs. Perrot & Chipiez's work on Egypt, lately published, referred to by the President in his address to the students on the 10th of December, and which is a mine of information and illustration. And here I must beg you to excuse me if in the course of this lecture I again go over some of the ground covered by the address of the President. His discourse was on art generally, it is true, but so much of the art of the ancients exists in the form of sculpture only, that the history of their art and of their sculpture is practically almost the same.

To return. The specimen to which I am now referring is a group of a man and his wife, evidently portraits of the occupants of the tomb where they were discovered. They are certainly not what can be called rude in execution, though they are somewhat doll-like in character; but the archaism is absolutely different in kind from the archaism of Greek art, which is purely typical, and which certainly did not begin with portraiture. This group is supposed to be of the third dynasty, and the imperfect character which we see in it does not seem necessarily to be the result of its extreme antiquity, but may be due to its being the work of an inferior artist; for another group, which is thought to be undoubtedly of the reign of King Senofern, the last king of that dynasty, also engraved in the book I have referred to, is hardly inferior to the best work of the kind which has been discovered. Of the previous stages which the art had gone through before this time when it appears thus springing full-grown into existence, we know nothing.

The type of the earlier sculpture is generally of this class,—single portrait statues and groups,—found in tombs. They are called "doubles," and are described by M. Maspero as supports to the soul of the deceased. Food was placed before them, and in some cases they are found accompanied by figures of their family and household. Thus servants are represented grinding flour or kneading the bread on which the "double" of the deceased was to live; and the scribe is also there, pen and papyrus in hand, to register accounts for his wooden or stone master, precisely as in life. The tombs have thus furnished us with a certain number of figures in action, an extreme rarity in Egyptian sculpture, and never, I believe, found elsewhere than in these Old Empire tombs. Smaller figures and statuettes have been found in the Theban tombs of the later dynasties, and these seem to have served the same purpose and to have represented the living soul of the deceased; in any case they were frequently the recipients of severe remonstrances addressed to them by their survivors if affairs went wrong after their death, in the form of protests written on slips of papyrus and attached to the body or the pedestal. Many of these have been found.

The earliest statues are, as I have said, of the third dynasty: the dynasty, that is, which preceded the dynasty of kings to whom we owe the Great Pyramids; and they are found in the tombs which abound in the neighbourhood of these and the numerous other pyramids in Lower Egypt at the head of the Nile Delta. The period of the third dynasty has been fixed approximately by Brugsch at from 3966 to 3766 before the Christian era. I do not know how far this view is generally accepted; but the opinion of certain English Egyptologists that the Memphian dynasties have no claim to greater antiquity than the Theban, and that, in fact, they were contemporaneous, is, I believe, now entirely discredited; it arose probably from the desire to make Egyptian history fit in with the dates assigned by theologians to the events of the Old Testament. Looking at the evidence supplied by the art alone, it would seem impossible that two important and flourishing kingdoms, of the same race of people and with one language, could exist for hundreds of years in immediate proximity to each other, not only with no natural frontier between them, but with the great highway of the Nile connecting them; and that thus, existing side by side, they should practise methods of art and architecture founded on totally different principles.

To return to the portrait-statues. We find that they are remarkable for the expression of life and character. The attitudes are restricted, but not so monotonous as in the later Theban art when it had become more idealised. The heads especially are amazingly life-like; with regard to their truth to nature and to character Messrs. Perrot and Chipiez make the same observation which I myself made in a short account of Egyptian art which I wrote three or four years ago,—that they recall those remarkable Florentine busts of the fifteenth century, of which you may see such admirable specimens in the South Kensington Museum. The limbs of these early figures also are much more studied from nature, and much truer to individual character than those of the later school; besides that the desire to make a portrait would lead the sculptor to render natural forms as closely as he could, a reason for this superiority may be found in the materials which were generally employed; wood and soft limestone would leave the sculptor more free to give expression to individual form, than the terribly intractable materials which were commonly used later on. The colossal size of the Theban statues would also, for reasons which I shall refer to presently, stand in the way of a faithful, or rather of an individual and realistic treatment. The tomb statues are always painted, and the most carefully finished have the eyes inserted in crystal and dark stone, the white being made of ivory or enamel, and the eyelashes attached in bronze; giving an appearance so life-like, even after an interval of from 5,000 to 6,000 years, that on a tomb containing two statues thus realistically embellished being opened by M. Mariette, the Arabs fled in terror, throwing down their tools, under the impression that they were living genii, and on recovering from their fright, were only prevented by a revolver from breaking them to pieces. This method of treating the eyes was not unknown to the Greeks; you may remember that the eyes of the chryselephantine statue of Pallas Athene by Pheidias, were similarly treated; and in the British Museum, at the entrance to the Egyptian Gallery, is a bronze statue of Apollo, which has the eyes in some white metal, the pupils being hollow, perhaps originally filled in with enamel. The effect of course is staring, now that the bronze is black with age. Formerly it may have been of a light golden brown, and was no doubt as brilliant in surface as the white metal in the eyes. To bear out my remarks on the natural treatment of the tomb-statues, I refer to two illustrations from Messrs. Perrot and Chipiez's book, one of the architect Nefer, who built one of the pyramids, and the other of a famous statue in wood, christened by the fellahs, the Mayor of the Village; both are in the Museum at Boulak. You will see in this figure of the architect a remarkable truthfulness in the rendering of the frame. There is a very thorough expression of the collar-bones, and in the torso, although it is small in the waist,—a characteristic of Egyptian figures from the earliest to the latest times,—the play of form due to the structural anatomy under the skin is fairly well expressed, and the arms are remarkable for truth of treatment. A very much injured headless statue of the fourth dynasty in the British Museum will show you the same qualities, although the execution is rougher than this seems to be. The varieties of position are limited,—standing, or, rather, walking, for one foot is invariably before the other, sitting, or squatting, with the knees up to the level of the chin. These are the usual positions; but we find also in the tombs of the Old Empire a few figures with more action, as servants grinding corn, kneading dough, scribes sitting cross-legged and writing, to which I have already alluded,—actions which are expressed with great fidelity to nature. Later, the attitudes in the statues, whether of gods, or kings, or mortals of humbler rank, appear to be strictly limited to the few positions I have described, and which, being very familiar to you, need no further description on my part. I must instance here a very beautiful and touching group, in painted limestone, in the British Museum. It is a work of the same class as those which I have been describing, and represents a husband and wife, sitting side by side. His hand is held in an affectionate manner in both of hers. This group is ascribed on the pedestal to the nineteenth dynasty. There is no inscription by which it can be dated, and it is not stated where it was found; I presume, therefore, that it is the style of treatment which has suggested the date given to it. According to Mr. Sharpe, who is, however, frequently a prejudiced, and therefore not a very safe guide, the heads are of the Lower Egypt type. If it be of the date given to it, it shows that the practice of making life-sized portrait groups for the tombs did not cease with the Old Empire. In any case it is a work of the highest beauty; perhaps the most beautiful Egyptian sculpture in the museum. The execution is both highly finished and faithful to nature; the attitudes, though formal, are easy; the finish given to the hair could not be surpassed, and the careful way in which each lock is tied at the end seems to point to its being a wig; but the feet, above all, are of beautiful workmanship, and are well worth studying,—in this differing from the generality of their works. The feet in the Old Empire statues are usually short and thick, and very much neglected in finish; later they are longer and straighter, as in the group I am describing, and it may be for this and other reasons derived from the workmanship that the date of the nineteenth dynasty is assigned to it. I would draw your attention to the perfect form of the nails, and to the distinction which is most delicately indicated between the male and the female foot, the former being equally elegant in shape, but having the tendons slightly more marked. The feet, of course, are not of the Greek type; they have the long, thin character of the Oriental foot, with slender, straight toes. We have in this group a combination of the qualities which we find in both periods of Egyptian art; a strong feeling for nature, and a generalisation of forms, which appears in this case to arise from the instinctive feeling of the artist, and not to be in accordance with prescription. The drapery is treated also with great delicacy, and in the usual manner, in parallel and radiating lines of great regularity, but perfectly expressing the arrangement of the material. And here I must protest against the assumption of Egyptologists on two points,—the treatment of the hair and of the drapery. I do not think that it follows, from the wig-like appearance given to the hair in the statues and reliefs, that the Egyptians all wore wigs; that they did wear them we know, for they have been found in the tombs, and there is one in perfect condition in the British Museum, and others, I believe, at Turin. But we find the hair of all classes represented in the same wig-like manner everywhere, and I have no doubt that this is merely the conventional manner of treating the hair in sculpture, and that we are not bound to assume that a wig is always intended. Again, it is always assumed that the regularity of the folds in the drapery implies the use of the gauffering machine. I will not say that the Egyptians did not gauffre their muslin; what is called a gauffering-machine has been found in a tomb, and is engraved in Wilkinson's "Ancient Egyptians." But the treatment of drapery is always the difficulty latest got over in the progress of art, and we find this regular treatment of folds in all early art; I believe these small regular lines, therefore, to be the means employed by the Egyptians to express the thin drapery which they wore, and which has a tendency to go into a number of fine parallel folds; just as the regularity of the zig-zag edging in Archaic Greek art is only a typical treatment of the natural tendency which the edge of drapery has to take this zig-zag form.*

THE FRENCH DECORATIVE ARTS AND A NEW STONE SUPPLY.

THE permanent Museum of Arts applied to Industry, held at the Palais de l'Industrie, in the Champs Élysées, Paris, after closing its doors for a few weeks, is now reopened. To the former exhibits two new sections have been added. The first is a room for mouldings, where ancient and modern specimens of ornamental art are collected, in such a manner as to facilitate teaching and study. At present the collection is not very rich; some fragments of architecture, some plaster casts, borrowed from various countries, are all that can be seen. The president of the Association, M. Antonin Proust, has, however, organised a workshop, where the moulding of models is carried forward with considerable activity. There will soon be a complete series of specimens ready,

* The remainder in our next. We have not space to give this and the succeeding lecture immediately, in full as delivered; but we regard the lectures as of so much value and interest that we propose to give them entire, by dividing them over four consecutive numbers.

divided into epochs, to which will be added galvanoplastic reproductions of bronzes and art works in other precious metals.

The second room contains a large assortment of marbles, agates, and various hard stones, recently discovered in the Department of the Vosges. The blocks are of unusual size, and it is considered that the find will prove of great advantage to architects, lapidaries, and others. In brilliancy and in delicacy of tone the stones are also much admired, and their size will facilitate the production of new and startling effects. The Department of the Vosges has always been renowned for its geological treasures. Up to the close of the sixteenth century its agates were celebrated, but no agate has ever been obtained from this district equal to that which is now on view in Paris. It is a mixture of amorphous and crystallised silica, disposed in irregular layers, on which are implanted prismatic crystals of amethysts of a most beautiful violet. The spaces that are not occupied by the violet quartz are filled with red jasper,—that is, silicious clay, coloured by oxide of iron.

The engineer of the quarries in the Vosges, whence this splendid agate has been derived, speaks in high terms of the recent discoveries, which are sufficiently important to reduce considerably the price of the ornamental stone used for building purposes. The stone of the Vosges is similar to that which the Egyptians of Syene employed when making obelisks, and is consequently called syenite. It is extracted from mountains whose dome-shaped summits explain the term *ballons*, by which the rock is generally designated in the country. The syenite is of a granitoid texture, its crystalline elements are solidly united by simple juxtaposition and not by any cementing substance. The fundamental elements, a feldspath or silica with potash and aluminia, and an amphibole or a ferro-magnesium silica, are thus intimately associated. To these two constituent elements the quartz of hyaline is added. This quartziferous syenite is found in very large quantities at Ternnay, where it is generally extracted to make columns, urns, tables, &c., and is known as the *syénite feuille morte* on account of its dead-leaf coloration. The whole of the Servance mountain is made of this stone, and blocks can be cut out measuring some 7 by 12 yards. When polished the effect is very striking. The red syenite is obtained in great quantities at Haut-du-Thenn, and is composed of amphibole and orthose without the quartz. When polished these stones give a brilliant reflection, and are able to resist atmospheric influences. This accounts for their high value; but now that a larger supply has been found it will be possible to employ the stone in many instances where formerly it was reserved only for rich amateurs.

MR. G. AITCHISON, A.R.A, ON COLOURED GLASS.*

So long as this so-called white glass was mainly as low in tone as the coloured, only one object was attained, but it was attained without a sacrifice of harmony; directly the white glass admitted the light freely the whole window was out of tone and the spectator was blinded with the patches of light. The third cause was the insane attempt of the glaziers to vie with the painters when they could already produce more divine things. They lost the reality to seize the shadow; accuracy of form, roundness, shadow, perspective, and aërial tints, so proper and excellent in a picture where the light is reflected, were absurd in a transparent material where the light came through the figures and where the sun blurred or destroyed every outline; but for all that the glaziers came down from their glory in the heavens to strive on earth with the painters, and to be ignominiously beaten, and until the end of the fifteenth century we gradually pass from poetry to prose. A round or a cusped line in the old glass was a sort of note that a niche was meant, but afterwards the architecture was nicely drawn, at first gilt and coloured, but gradually it became white, with the carving only in pale gold, and filled more than half the window; the figures, too, became better drawn, but their white mantles filled the larger part of the space left, the under-dress, the background of the niches, and the little left of sky beyond the architecture were alone deeply coloured; even the flesh became at last white; and this preponderance of white threw the whole scheme of colour out of tone. There were, of course, clever fellows amongst the glaziers, and the velvety quality of the white, like the texture of a cumulus cloud, is fascinating, but the capacity of raising emotion was gone.

In the twelfth and thirteenth centuries the sun adds additional glory to the windows; in the fifteenth and sixteenth it rather spoils them, though you must understand that this does not apply to the fifteenth-century windows of Florence Cathedral.

By some stroke of luck, Florence was to raise again the art to something like its pristine glory, and yet the Tuscans were no colourists. Ghiberti gave some designs for windows in the cathedral; an Italian gentleman had been studying the glazier's art at Lubeck, and is believed to have been putting windows into Holyrood Palace, when he was sent for to execute these windows. He established himself in Florence, and executed these and other windows in the cathedral designed by other artists, those in the chapels being the most lovely. Here, again, white was banished; but gold and emerald were the predominating colours, instead of crimson and azure. When the sunlight streams through these windows, you ask yourself if they are the rivers of health that cure all human ills, and fancy that the angels come to bathe their wings in this emerald and golden glory. Nothing is so beautiful as the windows at Florence but those at Chartres.

I must not omit a notice of the fourteenth-century windows. The most glorious of these that I have seen are those of the Chapter-house at York: subjects in patterns filled in between with jewelled grisaille, of so low a tone and so lovely and varied in colour, that it vies in beauty with the coloured glass. Unfortunately one window was destroyed; it was replaced with a modern one copied from the old, but of such a wretched quality of glass, that the light admitted differs but little in intensity from that which would come through ground glass, and makes a painful blot in the building; there are, too, some finely-coloured subjects in the aisle windows of the nave, but set in white with clear glass borders much too wide, and patched with rubbish, so that the windows look like a caliph's coat that has been worn by a beggar; you are so blinded by the sun coming through the slits, holes, and patches that you can scarcely see the beauty of the original stuff. The large west window and the large south window of the first transept of Canterbury Cathedral are glazed with panels of the old windows, some oblong, and some of the form of the *vesica piscis*, but with pure white borders, and apparently white tabernacle work in the tracery of the heads. These have a very good, though perhaps a curious, effect: the white is not the translucent velvety white, but jewelled white, and at a distance the effect of the windows is that of white jewelled windows, with a slight introduction of colour,—an effect by no means to be despised. At Fairford Church the windows are of the end of the fifteenth century, and though of unequal merit, contain many beautiful harmonies, and their drawing elicited the admiration of Van Dyck, one window on the south side is very beautiful, nearly all white, but the shading, which is of a rich brown, gives towards evening the effect of brown mother-o'-pearl, all the figures have white mantles, and only small pieces of the coloured dresses are seen,—crimson, claret, deep yellow. There are also many beautiful harmonies in the north clear-story of the nave, but generally much lighter in tone; but windows of the north side must necessarily he more transparent, as they get no sun.

There are beautiful and original harmonies in some of the clearstory windows of the choir at Cologne, in the side chapel at Strasburg, and in the transept at St. Maurice, Angers, at Pisa Cathedral, in St. Petronio at Bologna, Sta. Maria Novella at Florence, and elsewhere.

One of the most beautiful windows I have seen of the clear variety is the one of the fifteenth century by Vivarini in St. Giovane e Paulo at Venice: the subject is St. George killing the dragon. St. George is in steel armour, on a chestnut horse, transfixing the green dragon in a green field, behind him the blue distance, purple mountains, and blue sky. Signor Boni was kind enough to get this copied for me by Signor Alessandri, as I could not find that it was published.*

In a choir at the Cathedral of St. Maurice, Angers, there is a window of the giant St. Christopher carrying the infant Jesus on his shoulders, and wading through a stream; the sky is blue, and so is the water, and the saint has a mantle of deeper blue, with a bit of apple green vest showing above it, and a crimson scarf, his face and limbs are bronzed with the sun, his hair and beard are tawny, and with his staff of golden brown he steadies his steps; the infant has a fair chubby face with Italian features, a little light golden curling hair, and a nimbus, and is dressed in black; the black robe cuts against the blue sky, the blue mantle, the bronzed face, the tawny beard, and also against the crimson scarf, and altogether is one of the most striking and original harmonies I have seen, although it is clear and uniform in tone, and consequently misses all the jewelled glow and sparkle of the finest glass.

Von Linge's enamel windows may be fine when strong sunshine is on them, but in ordinary daylight they are nearly as opaque as a canvas.

If you want to see the effect of churches wholly lighted by stained glass, go to Fairford, to Strasburg Cathedral, to St. Étienne du Mont at Paris, and thence to Florence and Chartres, and to some of the mosques and houses in Egypt.

As to the application of glass, it is needless to say we do not want a brilliant light in cathedrals, in churches, in the halls of courts of justice, so pathetically called by the French the halls of wasted footsteps; in the halls and staircases of great public buildings, palaces, and private mansions; and the size of the windows in such places may be enlarged to make up for loss of light. In these, stained glass of the most splendid quality may be put, glass of the quality of the finest of the twelfth century or of that of Florence; but, of course, as far as the figure drawing and composition go, we want to have the best that can be got, and I may here remark that when this jewelled brilliancy and depth of colour is got, all decorative wall-painting must be simple and unobtrusive, and not try to vie with the gorgeous colours of the glass, but leave spaces comparatively plain for the eye to rest on. I never saw the windows of the Ste. Chapelle in Paris lighted by the early morning sun, but in ordinary daylight the effect of the rich painting and gilding lighted up by the still richer windows is oppressive, and we long for plain stonework or white windows.

But this quality of coloured glass is not suitable for living-rooms; in these we want but little deep or positive colour. If the outlook is pleasant or necessary, the colouring must be confined to window borders, and the colours must be sober, such that will not dazzle, fatigue, or annoy us. Slight colour may be successfully used where a blank wall or an unpleasant prospect is to be shut out. In picture galleries and other places where pure white light alone is wanted, we must banish colour if we cannot so blend it as to make pure white light; still, there is ample opportunity for much to be used, if it be but to give a little interest and warmth where half the year the prospect is most dreary, chilling, and forlorn. Nothing is prettier than to turn a skylight into a pergola, with vines and grapes, or to cover it with leaves of the Virginia creeper, or even with some pleasant pattern. A little colour with much human skill is mostly a pleasant object.

It is mainly owing to the Gothic revival that stained glass has been awakened from its long sleep, and has spread itself to such an amazing extent. Not only are our churches and cathedrals being filled with it, but it is a rare occurrence to find a new building or house of any pretension without some specimen of stained, painted, or enamelled glass.

Where the avowed object of the promoters of stained glass was imitation, we cannot blame those who executed it for producing imitations. The stereotyped phrase of one at least of the great deceased architects was:—"What would a thirteenth-century architect say of this?" and, if it was not the phrase, it was the thought of many other deceased architects, who, if less able, were more influential. Though we are now beginning to deplore these forgeries, whether in stone or stained glass, we must bear with what has been done, at any rate when it is not too abominably bad, and only hope that in the future the glass and the stone may bear the stamp of the century in which they are fashioned, that the figures should at least be well drawn, and the writing be that of our own

* Continuation of a lecture delivered at the Royal Academy on Monday, the 25th ult. (See p. 315, *ante*.)

* We shall give a drawing of this window shortly.

day. The present European costume is so ignoble that I fear it is beyond the power of art to fit it for a picture. To the best of my belief I have never seen a modern imitation of a twelfth or thirteenth century window that could be mistaken for a first-rate old one. The best imitations I know are those of the Ste. Chapelle, and, possibly, they might be taken for bad windows of the time, though the whole tone is too uniform. I do not say this out of any love for antiquity. I would, on the contrary, much rather think that the modern windows are the best. "The past is nothing, and at last the future can be but the past," but we must not shut our eyes to facts, and we must so use the works of the past as to enable us to excel them.

The glaziers tell us that the glory of old glass depends on its age, the decay of the glass, and its being partly covered with dust, the particles and oxides of the metals and lichens. But hear this from a glass-maker:—"Decay, undoubtedly, tends to harmonise the colours of glass, but there are specimens of ancient glass which show no signs of decay, and which, nevertheless, possess a softness and depth of colour which have seldom been attained by modern manufactures. . . . . The effect of old glass lies deeper than the surface, and depends upon its chemical and physical nature. . . . It resembles in its physical nature horn rather than glass. It is translucent, but neither appreciably refracts nor disperses the rays of light, merely sifting them, and suffering them to pass."*

Viollet-le-Duc also has some remarks to the point:—"The inequality of thickness in the glass which renders it so hard to fix in the lead is one of the conditions of the harmony and vivacity of the tones; when the pieces of glass are flat and of equal thickness, the light strikes all the pieces in a window at the same angle, and a uniform refraction ensues; but when these bits of glass are full of knobs, and unequal in thickness, they present to the light surfaces which are not on the same vertical plane, from which result varied refractions, adding peculiarly to the brilliancy of the tones and contributing to the harmony; thus it is that in matters of art the perfection of the product is often in inverse ratio to its effect."†

It is only necessary to see the best modern imitations of twelfth and thirteenth century glass in the same building, with fine old glass of the time, to be convinced that the statement is the result of a hallucination; the inferiority is too marked, the colours are less rich and less deep, and consequently no amount of obliteration will raise them to the level of the old glass.

Still, no one who has examined old glass can deny that it is generally nearly covered with dirt, that its outer surface looks worm-eaten, and some of it is often semi-opaque; chemical changes have added to its beauty, they have changed white into opal, and stress of wind and gravity have bulged the surface into hills and hollows, and so added to its tones, and dirt has contributed to its jewelled effect.

The most successful imitation of early fourteenth-century glass I have seen is the large north window in the transept at Durham by Messrs. Clayton & Bell, which has the throb and sparkle of old glass; but when we come to a later period, to the velvet white, and to the still more beautiful pale brown mother-o'-pearl, the imitations are excellent.

The clergyman of a country parish, even if he be a man of taste, cannot always prevent an abominable stained-glass window being put up by some wealthy parishioner; but surely in London, with a Royal Academy of Arts for an umpire, our public monuments should not be disgraced by the admission of abominations, about which they are not even consulted, though there may not be a professed glass-painter amongst them.

The south windows of the transept of Westminster Abbey might well have been enlarged from those in the plaster churches with a candle in them that are hawked about, and must make us a laughing-stock to all people of taste. Are they even equalled by the modern stained glass in Cologne Cathedral?

As to the prospects of stained glass, I said before that its extension has become vast, and of the prose sort there are beautiful and original varieties containing new harmonies of restrained colour, or, to say the least, harmonies that are new to me, and even if they have been extracted from minor harmonies in old glass, we should be none the less thankful; to bring into prominence overlooked beauties is a genius in itself. I may point to some of the windows in the eating-rooms of the South Kensington Museum; graceful designs may be found in the Holborn Restaurant and the First Avenue Hotel. Still I must say that, in comparison with the glorious deep-coloured jewelled glass, these prose varieties are like reading mellifluous poetry to yourself in comparison with hearing divine music sung by a genius. There is, however, one development that is absolutely new and lovely; three east windows in the aisles of Christchurch, Oxford, by Messrs. Morris Marshall, designed by Mr. Burne Jones; the upper tracery of one window is filled with sage-green foliage, almost opaque at a distance, the tracery being only marked out by the white edges of the glass, so that our attention is not called away from the main subjects. In the lights are saints and prophets all in white, each one nearly filling the space between the mullions, the deepest colour being the flesh and hair, and the whole of them are crowned with streaky pink nimbuses; the figures are walking on yellow gravel, and the background is of drapery in indigo and dull red and semi-opaque; the other windows have angels, also wholly in white, whose blue wings form the background; below are slightly coloured subjects on a white ground. It is something to say that we have found an original genius in stained glass.

It is scarcely necessary for a rapturous admirer of stained glass, who never looks on the windows of Florence or Chartres without feeling that if the dreams of youth could be realised, instead of being a saint, a hero, a poet, or a lawgiver, he would be a glazier, to defend the word; but there seems to be a notion that this word has something derogatory in it. No artist is shocked because he is called a painter, and it seems foolish when we have the word "quince" to call it an "apple of Cydonia." The master glazier was once as well paid, and consequently as well thought of, as the master builder or architect, and is probably very much better paid now than the architect. You will bear with my being prolix and discursive if by so doing I can save hurting any man's feelings.

I think no painter but Mr. Dicksee has ever given us a stained-glass window, and it is curious if stained glass has appealed more to the poets than the painters, but it may be that these have felt how impossible it is to give this coloured light. It is needless to say that the ordinary sketches, drawings, and chromo-lithographs only give vague hints of the colours, still they are useful and occasionally interesting. Some wags have published books of old stained glass, where nothing is given but the outlines in black and white; as colour is *the* point in stained glass we might as well have a book on the Greek statues in which the colour is given without the shape.

The poets have naturally been much struck with the beauty of stained glass. It is unnecessary to speak of "storied windows richly dight," or the Laureate's—

> "And thunder-music, rolling, shake
> The prophets blazon'd on the panes."
> *In Memoriam*, canto 86, stanza 2.

for you all know them.

But possibly Keats's lines are not so well known:—

> "And diamonded with panes of quaint device,
> Innumerable of stains and splendid dyes,
> As are the tiger-moth's deep-damask'd wings;
> And in the 'midst, 'mong thousand heraldries,
> And twilight saints, and dim emblazonings,
> A shielded scutcheon blush'd with blood of queens and kings."—*The Eve of St. Agnes*, stanza 24.

Painters are nothing if they are not colourists, and I often wonder how it is that more of them do not turn glaziers, when I think of the delight magnificent stained-glass windows can bestow upon mankind; it is not only that they can give us a feast of colour unattainable by other means, but that there is an infinite field for Scripture, historical and portrait subjects, that is unfortunately almost closed to any other form of art, in which the noblest forms, the most subtle composition, and the most original harmonies may be indulged in, if they will not forget that it is light they are dealing with, and not a canvas, and remember Theophilus's remark that he had sought "by what subtlety of art and variety of colour a work may be adorned and may not exclude the light of day, nor the rays of the sun."

Painters do occasionally give cartoons, even coloured ones, but unless the painter is a glazier too, the colour is not much more than a hint that the colours indicated may be tried to see if they will make a harmony in glass. The cartoon will tell him neither how the colours will be mutually affected when the light streams through them, nor how the whole will look 50 ft. above the eye; much less will it tell him how the window will look in sunshine. If it takes ten years to learn the art of using oil-paint, to use coloured glass will not come by instinct.

Although the designing and making coloured, stained, and painted glass windows is artist's and not architect's work, I trust that the remarks that I have made to-night on this splendid adjunct to your buildings may not be looked upon by the architects as a useless waste of their time.

If our art should be fortunate enough to attract to it a man who, like your President, shines in all the arts, glass-painting may be a subject worthy, not only of his consideration, but of his talents; it may afford, too, an almost unlimited scope to artists for employing their skill from the slightest suggestion in enamel to the glorious richness of transcendental colour, and without debarring them from the use of noble form and masterly composition, if they will only deign to consider that the paramount object, at least in the fuller variety, is lovely colour and not bad pictures.

Coloured glass is, undoubtedly, for the colourist, the means by which the highest effects of colour may be reached, and, for the lover of colour, the means of producing a rapture analogous only in its effects to that produced on musical devotees by the finest music without words.*

NEW DISCOVERIES AT SÈVRES.

MONSIEUR LAUTH, the director of the Sèvres State Porcelain Manufactory, has made important discoveries, which will, we are told, render modern china as rich in tone as the ancient specimens of Eastern ceramic art. The results attained, though officially proclaimed, have not as yet been shown to the public. During the course of this year we shall have the advantage of examining these improvements, for some specimens will be sent to the biennial Exhibition of Fine Arts applied to Industry, to be held at the Palace in the Champs Élysées.

So much has been said concerning the ceramic arts that it is unnecessary to describe the various modes of manufacture or the materials employed to produce plain and enamelled hard ware, plain and decorated porcelain, soft and hard clay. The hard clay is made of pure kaolin, and its adamantine enamel is due to the admixture of feldspar, while the ordinary tender clay is mixed with silex. In theory special colours are used for these different materials. The colouring oxides which resist the baking of soft clay are volatilised on the hard clay, which is exposed to a heat of 1,500° C. The number of colours that can be used for the latter product is therefore very limited. Nevertheless, the Chinese and other Oriental peoples obtained a richness and depth of tone, a unity and harmony of tint and colour, that excelled even the best Sèvres work. With the assistance of M. Voght, the chief of the laboratory, M. Lauth instituted a series of experiments and researches, so as to discover some mixture which would enable the clay to support the colouring, in spite of the currents of oxygen produced by excessive heat. Success finally rewarded these efforts,—not merely laboratory success, but a manufacturing success. The specimens produced are not flat and simple pieces of hard ware or porcelain, but large works of art. Nor is the result accidental, that is, unreliable; but the process, once known, can be carried out with the certainty of success. This, if anything, is an improvement on the ancients, for their colours did not take in every case, and their successes were always accompanied by a certain number of failures.

The objects, both large and small, that have already been manufactured at Sèvres according to this new method are especially striking by their modern appearance. The colours imitate, or, rather, reproduce the richness of tone of ancient and Eastern ceramic

* Technological Handbook, "The Principles of Glass-making, 1883," pages 95, 96.
† Viollet-le-Duc, "Dict. Raisonné," art. "Vitrail."

* I have to return thanks for the kindness I have received at the hands of Sir P. Cunliffe Owen and the South Kensington authorities for the loan of the Arab window; to Messrs. Burke & Co. for their slabs of onyx and alabaster; and to Messrs. Clayton & Bell for the magnificent series of drawings showing the examples of stained glass of different periods.—G. A.

art, but the designs and ideas are altogether modern and western. The orange and citron yellows are as vivid as in nature, and the turquoise blue is perfect. This new porcelain, according to M. Ch. Burty, who has been admitted to a private view, is transparent, and will maintain the high reputation of Sèvres for both cream and milk whites. These advantages, however, we shall be able to judge of for ourselves at the forthcoming exhibition; and we are further promised the publication in the French *Official Journal*, and other papers, of a *mémoire*, describing in full the methods employed to produce these colours. The *Revue des Arts Décoratifs* loudly protests, however, against this decision, which it qualifies as unpatriotic.

The Sèvres manufactory is a laboratory maintained out of the public funds, and if "secrets" are there discovered, it is only right that France should be the first to benefit from them. Formerly this principle was applied in an exaggerated manner, for even the French manufacturers were not allowed to imitate the Sèvres work. The reason given for this was the fear that the workmen, when once acquainted with the method employed, would be bribed by foreigners, and that other nations would profit by the discoveries made at Sèvres. These fears need not, however, have been entertained. The manufacture is too complex for a workman to understand all its details. The hours of baking, the composition of the enamels, the preparation of the kaolin, the proportional admixture of chemicals, the special form of the baking-stoves, the skilled manual work in forming the clay,—all these are separate crafts in themselves. A manufacturer who spent several days at Sèvres might be taught by Mr. Lauth how to carry out in his own factory the new processes adopted; but naturally a foreign rival would not be allowed to participate in such lessons. By the publication in the *Official Journal* of the means employed foreigners will be able, however, to make at least bad imitations, which will injure the reputation of French wares. It would be better policy to keep the matter altogether a secret, or else allow foreigners not merely to read, but to see how the new colours are obtained. Such liberality could not fail to be appreciated by other nationalities, and France would have the right to expect some compensating advantage. It will be almost impossible to prevent imitations of the Sèvres porcelain, and, as these will as often as not be sold for real Sèvres, they should be as good as possible, or the reputation of the great State manufactory will be compromised. Secrecy in the nineteenth century is hardly practicable, and the authorities, making a virtue of necessity, would do well to place no restrictions on the publicity they intend to give to their recent discoveries. The whole world will be indebted to France if the manufacturers of china can be taught, by the example given at Sèvres, how to reproduce the rich tones that glorified ancient ceramic art.

THE MARBLE STORES OF ROME.

IT will be remembered that about sixteen years ago a very large quantity of marble blocks, of the finest quality, was discovered at Rome. Pope Pius IX. made numerous presents of the marble found to various churches. The store of marble was discovered by Signor Visconti, the archæologist, who carried on excavations with the assistance granted by the Pope, and received the title of Baron for his extraordinary success. The discoverer wrote at the time:—"There is an uninterrupted store of marble and alabaster blocks, of the rarest and most valuable descriptions, extending from Rome as far as the sea. I estimate the value of those blocks, which are only covered by a thin layer of earth, at several million francs. The stores became established in a very simple manner. The marble required for building at Rome, especially under the Cæsars, came from the African quarries, where the convicts condemned *ad metalla* had to work. Those blocks arrived dressed ready for use at Rome, where they were unloaded in the Emporium, whence they were taken as wanted. Whether there was an interruption in building operations or not, the marble blocks still continued to arrive, for the convicts had to be kept employed. When the Emporium became filled, the blocks were unloaded somewhat lower down the river, until at last the whole shore, as far down as Ostia, the harbour of Rome, became covered with them. They were never removed. Who was to do it in that district bare of inhabitants, and at a period when the monuments of Rome itself were used as stone quarries? In time, during the decay of the empire and the irruptions of the barbarians, the marble blocks became covered with a layer of earth, and also partly sank into the ground by their own weight. Hence there is to be found there an extraordinary store of the most beautiful classic yellow and red marbles, the finest description of porphyry, &c." The work begun by Signor Visconti was most successful. It was discontinued because the marble first found had to be used. Soon after Rome was occupied by the Piedmontese, who had their hands full for a time in establishing themselves in the Eternal City. But now there appears to be every probability that those important stores of marble will at last be utilised.

THE COMPETITION FOR THE AMSTERDAM EXCHANGE.

THE *Wochenblatt für Architekten und Ingenieure* lately published the details of the above international competition, for which designs must be sent in before May 1st, 1884, at Amsterdam. There will be a general and a select competition. For the former there are required a plan of the situation (scale 1 : 500), two ground-plans, four views, one longitudinal section, and two cross sections (scale 1 : 200), besides an explanatory statement in Dutch, English, French, or German, but written in Roman letters. This competition is anonymous, and the jury will be international in its character. The ten best designs will be selected and will each be remunerated with 80*l.*, the plans becoming the property of the city. Five of these will be admitted to the final competition, and an exhibition will take place for fourteen days of all the plans received.

The definite building programme will then be drawn up by the jury, and the five competitors will be remunerated after the ensuing decision in order of merit, with 800*l.*, 500*l.*, 400*l.*, 330*l.*, and 250*l.*, the designs becoming the property of the city. Unless any important reason exists for not doing so, the author of the best design will be entrusted with the execution of the work at a remuneration to be arranged. If he is not entrusted with it, he is to receive a certain sum beyond the 800*l.* as compensation. The exchange-room will have a superficial area of about 32,000 square feet. Further details can be had from Secretary Neufville, Kantoor van de Burgemeester und Wethouders van Amsterdam.

THE COMPETITION FOR THE STOCKHOLM MUSEUM.

THE administration of the Northern Museum at Stockholm issued in February, 1883, a programme for the erection of a new building. The participation of architects has, however, not been upon the anticipated scale of importance; this fact being attributed by the *Deutsche Bauzeitung* to the limited time and the small value of the prizes offered. Sixteen projects were received: eight from Sweden, one from London, one from Vienna, one from Prague, and five from Germany. The highest prizes were awarded to three of the last-mentioned five designs, which, it is remarked, is gratifying to the profession in Germany.

A Matter of Public Convenience.—At the meeting of the Paddington Vestry on Tuesday last (March 4) Mr. Mark H. Judge proposed the following resolution, which was carried by a large majority, viz.:—"That in the opinion of this Vestry it is highly desirable that public lavatory accommodation (with w.c.'s, &c.) for both men and women should be provided for the use of every part of the parish; and that a special committee of ten members be appointed to consider and report as to whether this accommodation cannot be provided in such a way as to be a boon to the immediate vicinity in which it is placed, instead of being a nuisance, as must be the case, more or less, where structures for this purpose are erected in the centre of the public thoroughfare." A committee was at once appointed to carry out the resolution. We hope other vestries will follow suit.

MEDIÆVAL WROUGHT IRON-WORK.

HADDON HALL.—YORK MINSTER.

WE give this week two examples,—memoranda they may be considered by those who already know them,—of the free and effective treatment of wrought-iron characteristic of mediæval work of this kind. In both examples, the fire-dog from Haddon Hall, and the door from York Minster,—no attempt is made at the symmetry which a Classic or Renaissance worker would, probably, have considered a *sine quâ non*; they are free sketches in metal, carried out in accordance with the immediate impulse of the workman. They are reproduced from pen sketches by Mr. W. R. Lethaby, as free and masterly in their way as the work they represent.

ST. NICHOLAS CHURCH, BLAKENEY.

THE view which we give of the interior of this fine church shows it as it is intended to be when the restoration and the clearing out process, which is now in hand, is complete. The following extracts from the report of the architect, Mr. H. J. Green, A.R.I.B.A., of Norwich, will give an idea of what is required and proposed to be done:—

"The roofs require to be dealt with in the first instance, owing to their decayed and dangerous state, and it would be undesirable to leave them until other works have been done. To carry out this work satisfactorily, it will be advisable to strip off the old lead, which is in very bad condition, one bay at a time, and recast it, making good the deficiency with new; the timbers require to be reframed and strengthened where necessary by splicing and halving the decayed ends.

The windows in many instances require considerable repair by cutting out the old and defective stone cills, jambs, and tracery, and replacing the same with new masonry, and filling the openings with cathedral glass worked in lead quarries. Such works having been completed, before touching the interior of the church it would be better (if funds will allow) to deal with the outside fabric, such as repairs to buttresses, copings, the re-facing and re-pointing of walls which are subject to the action of the weather, the removal of soil from the foundations, the formation of an open channel brick gutter set in cement to carry away the water from the new rain-water pipes leading from the roofs, instead of allowing it to percolate into the foundations, which is the cause of many settlements.

The tower next requires attention; the masonry in several instances is so loose that periodically the stone quoins of the buttresses are actually removed from their places by the force of the wind, the entire outside face of the walls must be carefully re-pointed, and all cracks grouted in with liquid cement, and the inside faces rough plastered; the belfry and bell-framing have especially suffered by the continual rain being blown in for the want of proper tracery in the windows and protecting louvres. The lead work of the roof is worn into holes, and the timbers decayed, as are also the beams to the two floor stages; the parapets are loose, and require some little looking to. It would add immensely to the general appearance if the four pinnacles were replaced in their pristine position.

In proceeding to restore the inside fabric, the wall-surface and stonework must be relieved of its many coats of whitewash, the latter carefully scraped, cleaned, and made good where defective, the walls re-plastered, and finished with stucco.

The fittings,—that is to say, the west gallery and the old square pews,—must be entirely removed, the floors taken up, and the passages laid with tiles. The seat spaces are proposed to be covered with wooden blocks on a bed of concrete (no more expensive than the ordinary floor,—the chief object in using these blocks is to avoid noise).

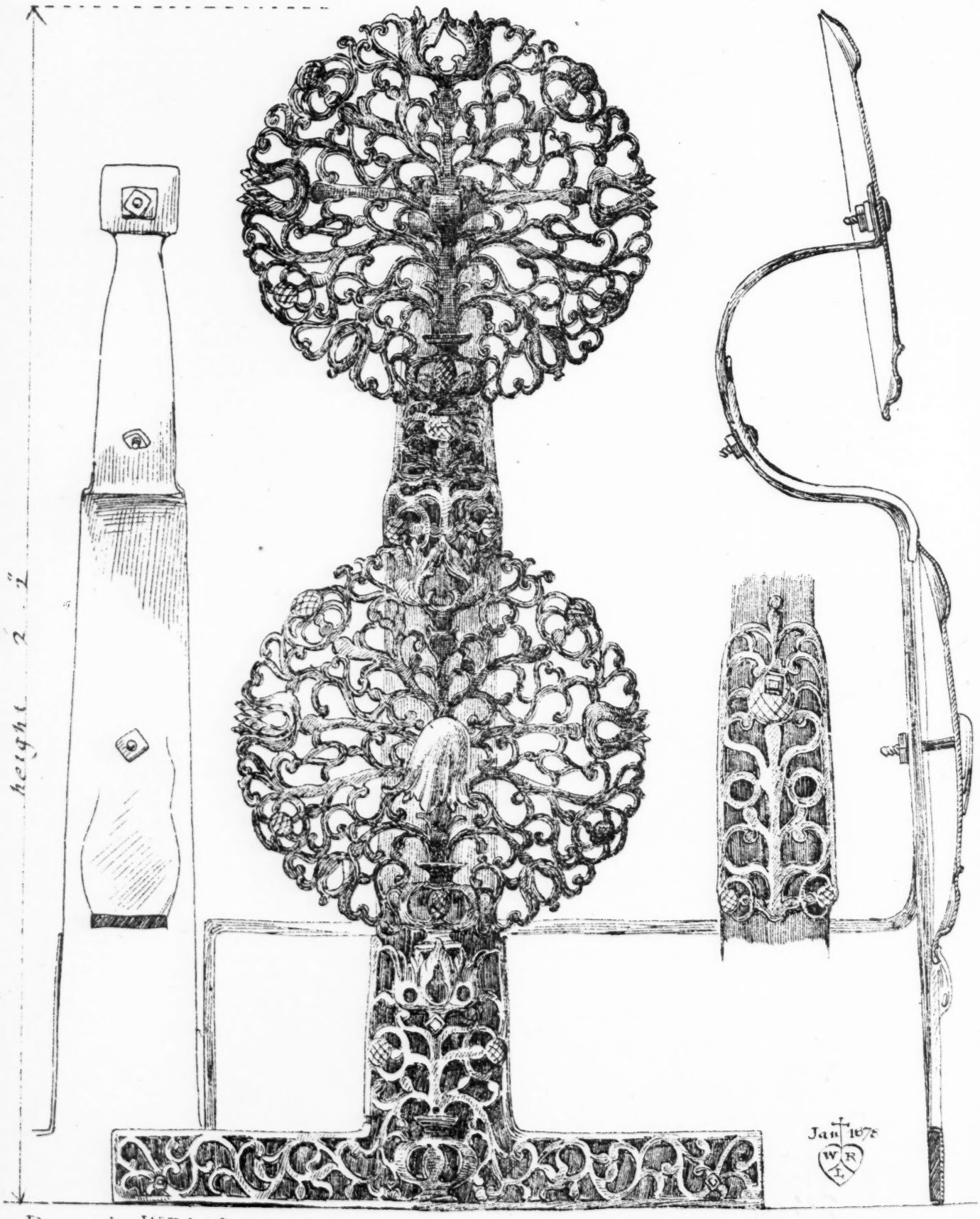
The old carved bench-ends are in a sufficient state of good repair to be re-used, substituting new framing for the backs and seats.

The old miserere stalls and carved tracery should be preserved, and placed in the chancel for the use of the choir."

The repair of the nave and aisle roofs is now proceeding, at a cost of about 2,000*l.* The roof, as will be seen, bears considerable resemblance to the well-known timber roof of Trunch Church, in the same county.

THE PROPOSED MONUMENT TO VICTOR EMMANUEL.

WE give engravings of two of the designs which received premiums in this competition; some general remarks on the whole collection (which included ninety-eight designs) will be found on page 143 *ante*. We shall give another of the designs next week. As to the actual execution of any design no decision appears to have been arrived at as yet.

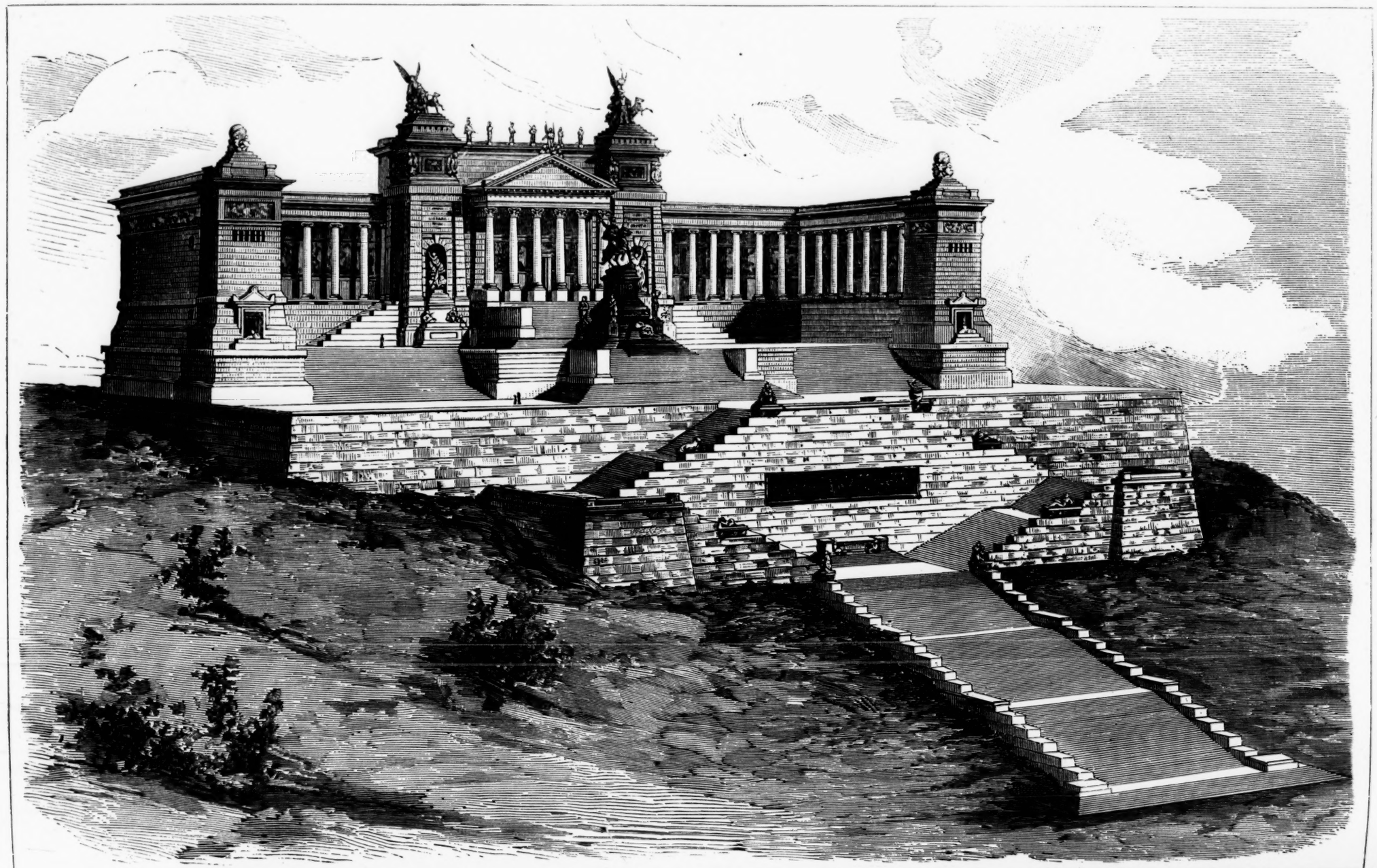


Drawn by W. R. Lethaby

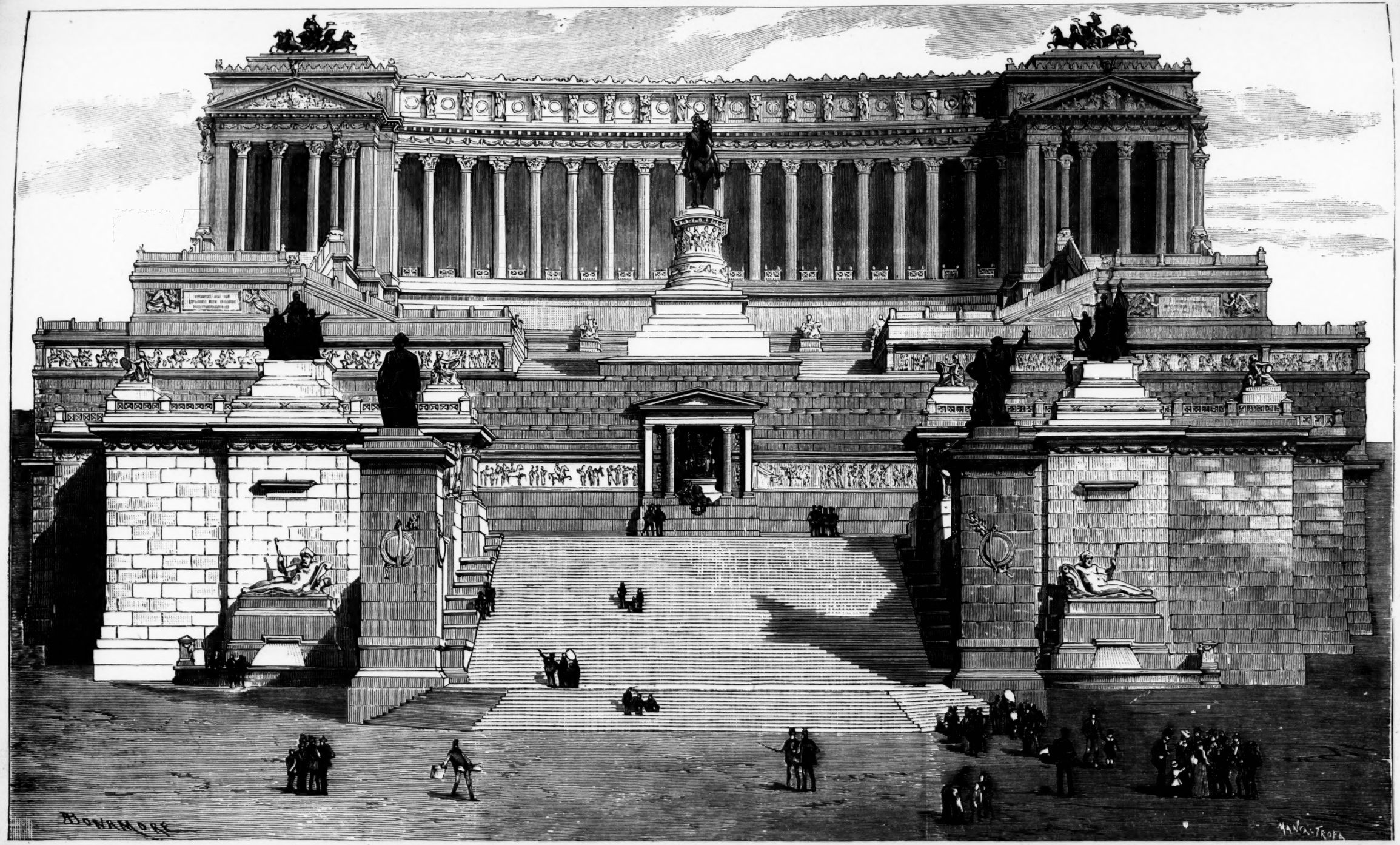
HADDON HALL FIREDOGS IN WITHDRAWING ROOM

C. F. Aell Photo-Lith & Printer.

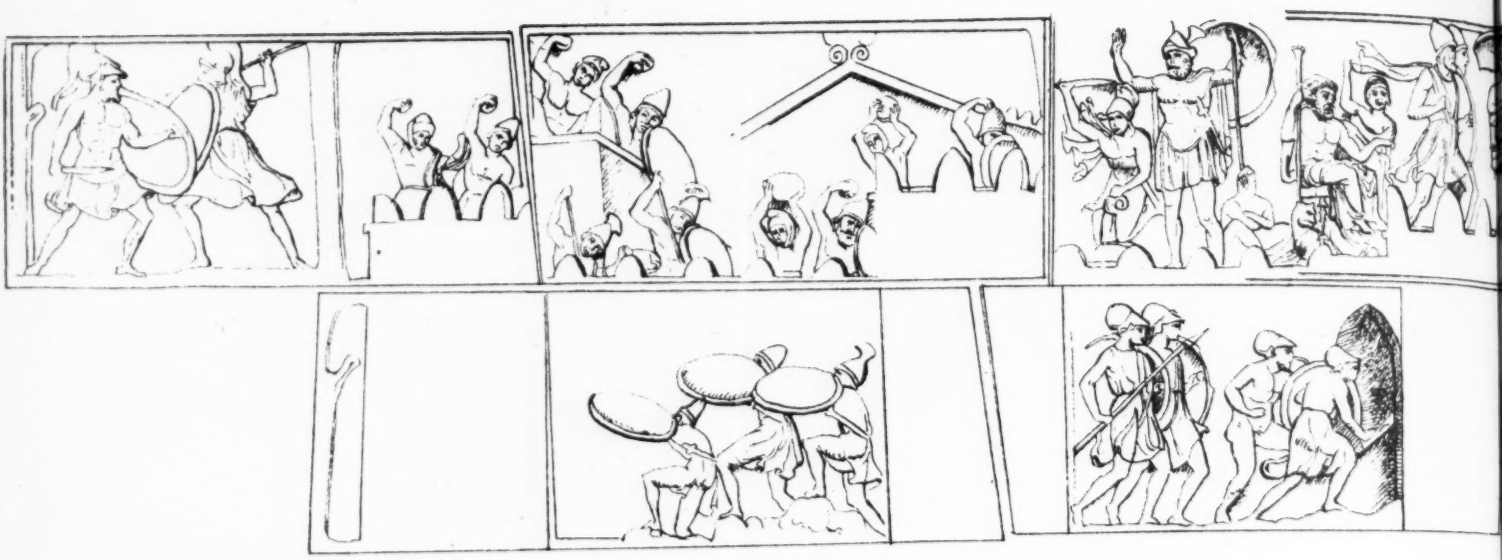
8, Castle St. Holborn, London E.

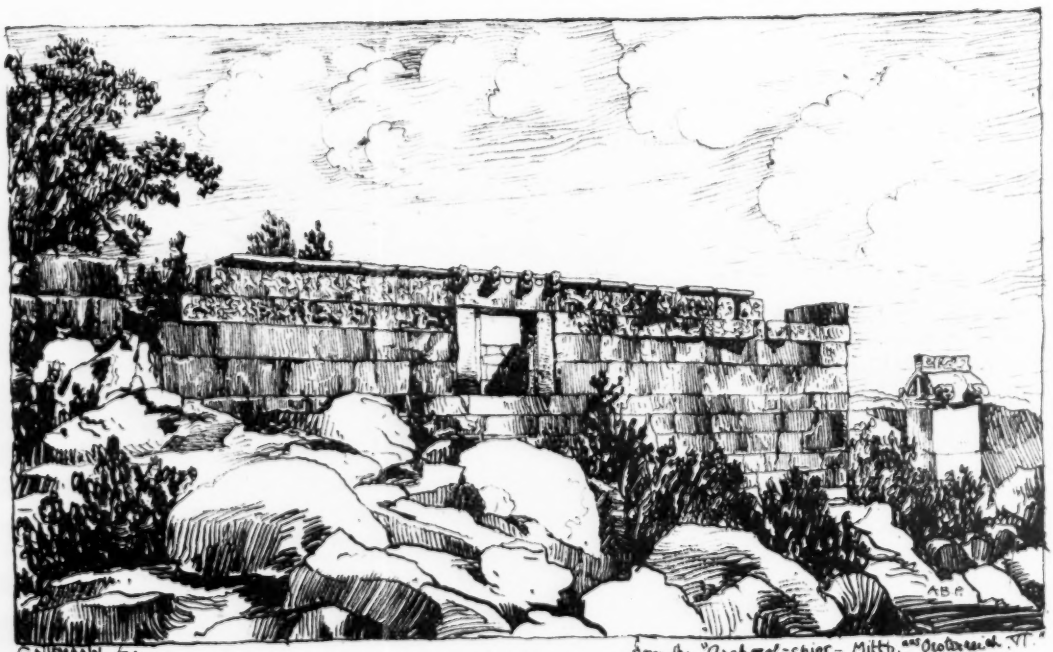


COMPETITION FOR THE MONUMENT TO VICTOR EMANUEL AT ROME.—Design by M. Bruno Schmitz.



COMPETITION FOR THE MONUMENT TO VICTOR EMANUEL AT ROME.—DESIGN BY SIGNOR GIUSEPPE SACCONI.

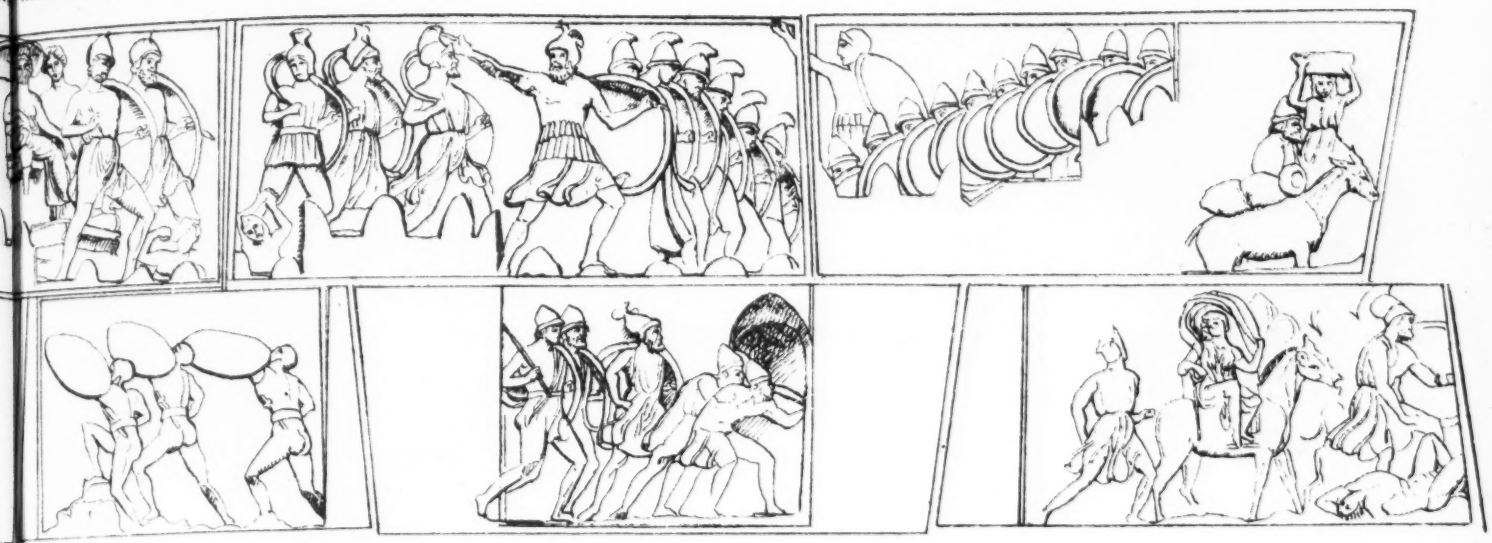


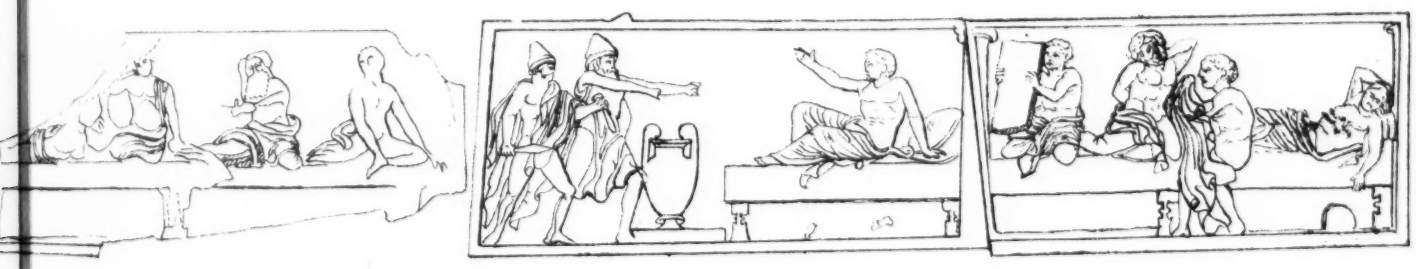


GNIEMANN fec. from the "Archæol-epigr- Mitth. aus Oesterreich VI."

South East View.

C. F. Kell Photo-Lith & Printer





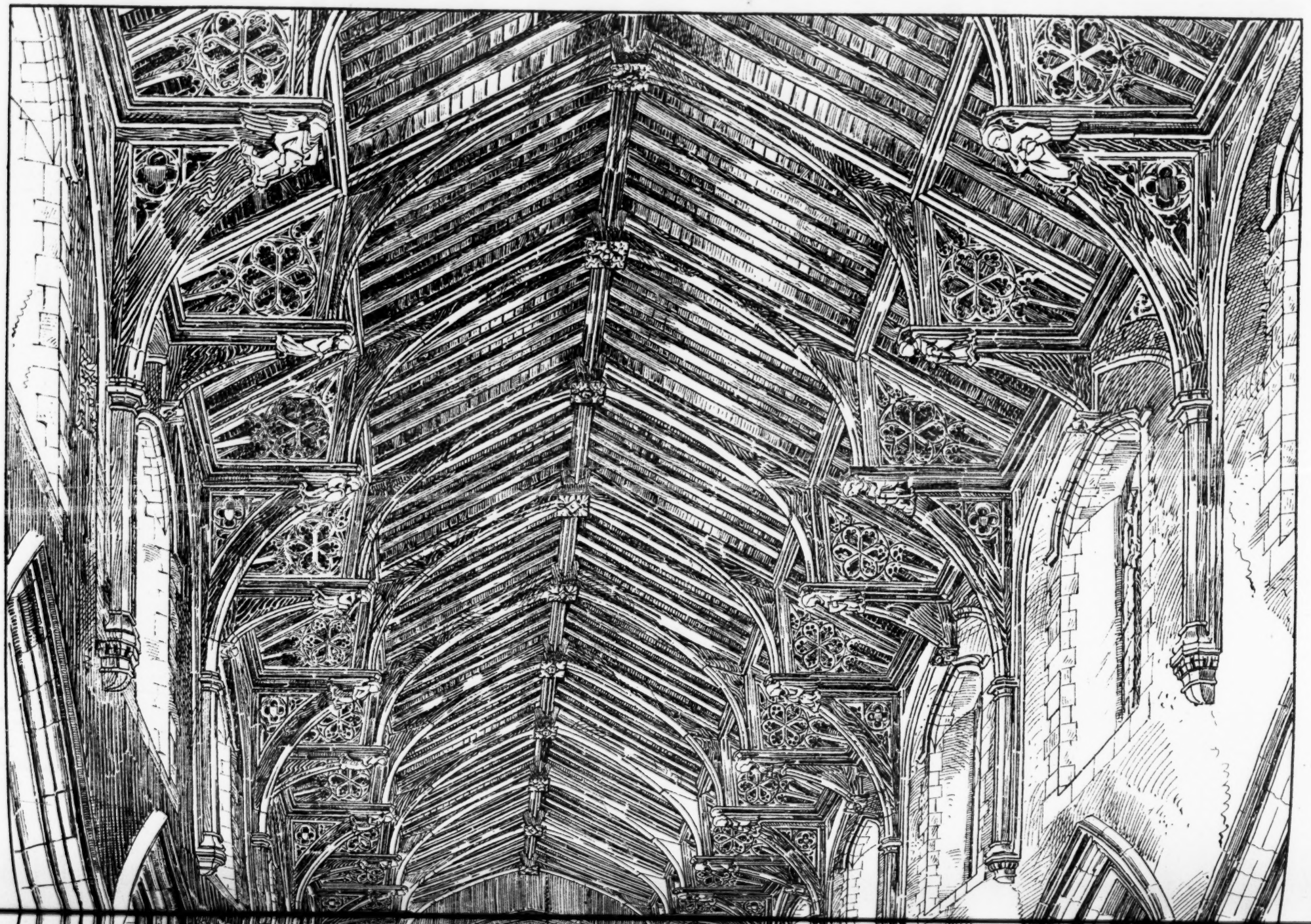
THE TOMB AT DJÖLBASHI IN LYCIA

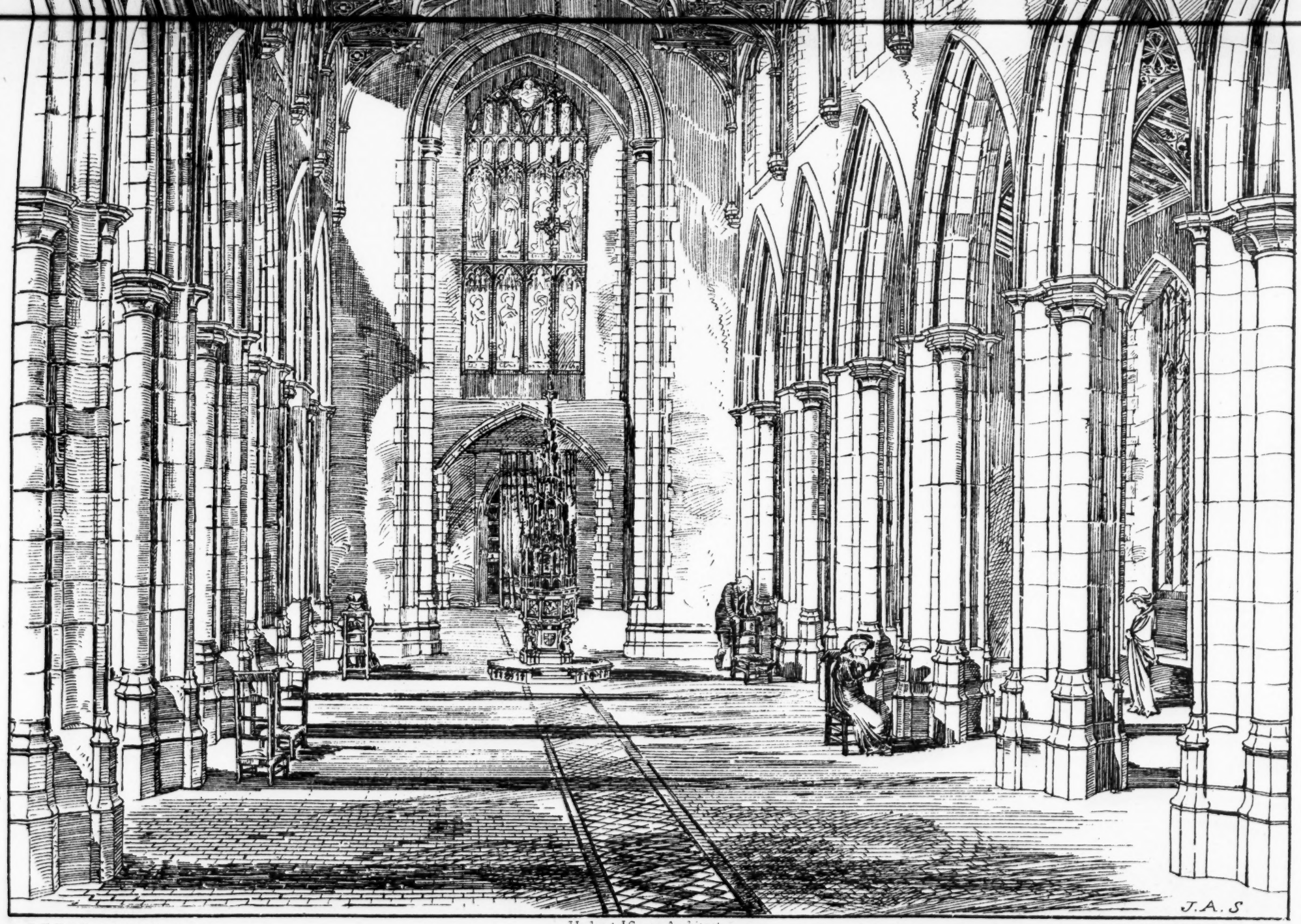
illustrating the second lecture given at

THE ROYAL ACADEMY February 28 1884

by Professor C.T. NEWTON C.B.

S. Castle St. Holborn London. E.C.



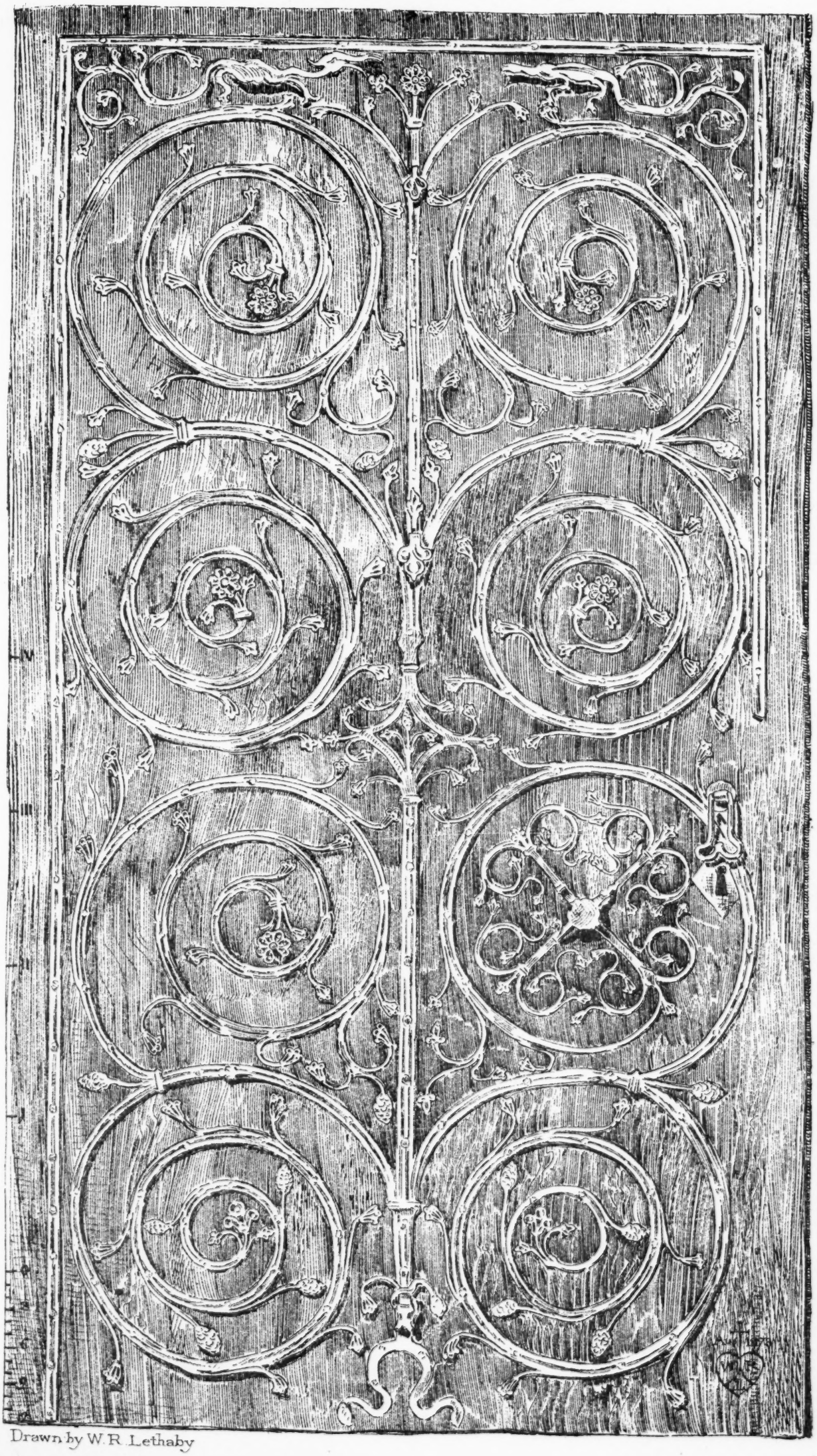


C F Kell Photo-Lith & Printer

Herbert J.Green Architect

8.Castle St Holborn.London.E C

BLAKENEY CHURCH, NORFOLK.—Interior looking West, Showing Proposed Restoration.



Drawn by W. R. Lethaby

YORK CATHEDRAL: IRONWORK ON CHAPTER HOUSE DOOR

C.F. Kell Photo-Lith. & Printer. 8 Castle St. Holborn, London, E.C.

ANCIENT SCULPTURE.

ROYAL ACADEMY LECTURES.

IN his previous lecture at the Royal Academy* Professor Newton, C.B., traced the history of Greek art, its rise, growth, and decay, and spoke of the manner in which it had been unearthed by archæologists of various ages and countries from the grave which hid it from view. On the evening of the 28th ult. he dealt with the period from 1850 to the present year, a period distinguished by the variety and success of expeditions for the discovery of ancient art. England, France, Italy, and Germany all took part in these enterprises, and we must add the discoveries of Schliemann and Cesnola, who have contributed to this great object by private enterprise. The researches made in these expeditions extend over a large portion of both the western and eastern Mediterranean, from Bengazi in the Pashalik of Tripoli to Asia Minor, from Rhodes to the Crimea,—in fact, over the whole area of civilised Hellas. Dividing the period of thirty-three years into decades, the lecturer dealt first with the discoveries made between 1850 and 1870. In 1855 he was himself sent on an expedition to Budrum, on the west coast of Asia Minor, in the course of which he found the Mausoleum at Halicarnassus, the colossal lion on the statue of Demeter at Cnidos, and the archaic statues at Branchidæ. Between 1860 and 1870 a most interesting series of sepulchral monuments was found in Athens, in a place called Agia Triada. In the next decade, extending from 1870 to 1880, Mr. Wood ascertained the site of the Temple of Diana at Ephesus, and in the same period Mycene was explored by Schliemann, interesting discoveries were made on the southern slope of the Acropolis at Athens, and the Germans made an expedition to Olympia, which was remarkable for its perfect organisation and the self-sacrifice on the part of the German people with which it was carried out. In the same period we have a French expedition to Delos, an Austrian expedition to Samothrace, an American expedition to Assos, and a German expedition to Pergamum. Remarkable discoveries were at the same time made in Cyprus by Cesnola. Finally, discoveries were made in Lycia, including the exploration of the remarkable monument at Djölbashi, by Benndorf.

The discoveries at Branchidæ, Olympia, and Mycene, and the statues found at Samothrace, Delos, and Samos, have added much to our knowledge of archaic art in the period from 600 to 450 B.C. From Olympia we gain a knowledge of the works of Pæonius, the great contemporary of Pheidias, who is mentioned by Pausanias in connexion with the sculptures in the temple of Zeus at Olympia. The pedimental sculptures of Pæonius, and those attributed to Alkamenes in the opposite pediment, are, however, not worthy of the reputation of either artist. The Nike, the chief work of Pæonius, independently of its artistic merit, has a peculiar value, because the inscription on its base records the name of the sculptor.

Winckelmann, who had never seen the works of the time of Pheidias, formed his ideas of the style of Praxiteles and Scopas, the successors of Pheidias, in the fourth century B.C., from copies of their works in the Roman Museum. But recent discoveries have taught us the general characteristics of these two great sculptors. We have an excellent example of the art of Praxiteles in the statue of the god Hermes holding the infant Dionysus, found in the Heraion at Olympia. The sculptures of the Mausoleum are inspired by the genius of Scopas, and we may assume that the friezes were the work of his school. Praxiteles and Scopas were followed by Lysippus, of whose sculptures we have no certain example, as he worked in bronze, not marble, and the finest works in bronze were carried off by the Roman Proconsuls, and afterwards melted down in conflagrations. We know, however, that in his time a reaction took place in favour of realistic sculpture, and his brother Lysistratos is said to have been the first make a study of a man's face from a cast to from nature. Examples of this realistic tendency may be recognised in the bronze head of a boxer found at Olympia, the head of an African found at Cyrene, the marble statue of the boy extracting a thorn from his foot in the British Museum, all which works are remarkable for their truth to nature and vigour of conception.

Recent discoveries have also filled in some great gaps in the history of the Macedonian or Hellenitic period, formerly one of the obscurest phases of Greek art. The Victory at Samothrace, and the reliefs from the altar at Pergamum are so many new lights thrown on the art of an age of which hardly anything was known except the statement in Pliny that after the death of Lysippus there was a great falling-off in Greek art both in style and invention.

The lecturer then explained the order of discovery by a series of beautiful diagrams. One of these represented the site of a discovery made at Athens in 1863. Here a man digging in a vineyard came upon a piece of marble, which proved to be the top of a stele 20 ft. high. This led to the discovery of a row of tombs remarkable for their beauty. Other diagrams represented single sepulchral monuments. One of these commemorated an Athenian who fell in the battle of Corinth B.C. 396. Another showed the torso of Victory from Samothrace, which resembles the design on the silver coins of Demetrius Poliorcetes, namely the prow of a ship with a Victory standing upon it. The remains of this statue were found by the French; and Conzé afterwards explored the island, and discovered some large blocks of marble, which, on being put together, made the prow of a ship. The French exported these remains to the Louvre, and appropriating a whole court for the purpose, built up the blocks in their original form as a prow, and placed the Victory upon it. On another diagram was a restoration of the Greek altar at Pergamum, a great building having two wings with porticos, and a flight of steps between them. In the diagram smoke is seen ascending from the sacrifice. This altar is mentioned only once in history, and then by an obscure author called Ampelius, who wrote a work on the Wonders of the World in the second century A.D. It was probably built in commemoration of the victories which Eumenes II., king of Pergamum, gained over the barbarians. Another diagram represented a portion of the frieze which ran round the colonnade of the temple, portraying the Battle of the Gods and Giants, in groups of heroic size. This discovery is due to Mr. Humann, a German engineer, who, when travelling in Asia Minor, came to Pergamum, and here found enormous pieces of sculpture built into Byzantine walls. He took them to Berlin, when the mortar was cleared away, and the many fragments were fitted into their places. What strikes us most in this frieze is the strongly-marked expression of passion which is shown us in the faces. Many people think Greek art too cold, and do not appreciate the desire of the Greeks to maintain a balance of expression in which no human passion is allowed to interfere with the dominant beauty of the whole. Those who are in quest of the sensational in art will be gratified by the wonderful amount of expression exhibited in the Pergamene compositions, although the overcrowding with extravagant draperies shock an eye trained in the school of Pheidias. The emotional character of Pergamene sculpture may be partly due to the influence of the more fully-developed schools of painting of the century. When we study the Laocoön in connexion with the great Pergamene compositions, we see how evidently it is derived from a kindred source, and we can no longer regard it as an isolated phenomenon. The group in the Ludovici Villa, formerly called Arria and Pætus, and the Dying Gladiator, represent an earlier stage of the Pergamene school.

In conclusion, the lecturer spoke of a tomb discovered near Myra, in Lycia, by Schönborn, in 1842. It consists of a peribolus, or walled precinct, within which is an enormous sarcophagus. It remained unexplored until two years ago, when the Austrians sent an expedition to the place, and carried off about 300 ft. of frieze. Picturesque views of the gateway illustrated this portion of the lecture, and photographs showed the walls crowned with a double frieze, which represented many mythical subjects. In the composition of these friezes there is this peculiarity, that the whole action; for the most part arranged in two parallel lines, is continued through both friezes in places. Among the subjects are Ulysses slaying the Suitors, and the Hunt of the Calydonian Boar. A variety of other myths are shown, which apparently have no connexion with each other, and we cannot detect in their selection that chain of mythical affinities which is found in the odes of Pindar. These Djölbashi monuments, in spite of the injuries done to their surface, are superior to the Lycian monuments brought home by Sir Charles Fellowes, which, although very interesting, are decidedly provincial in execution. The relief is so low, one can imagine that if the frieze were coloured it would look like mural painting, and it is suggested that the artists may have borrowed their conceptions from some of the works of Polygnotus and his contemporaries in the age of Pericles. If so, we have in this remote corner of Lycia sculpture which may serve to give us some idea of the great Athenian school of painters of the fifth century B.C., and shadows or reflections of works which the world may never hope to see in their original form. These Djölbashi friezes have been thought by some German archæologists to be as early as the fifth century B.C.; but Mr. Newton is disposed to think that they may be as late as the middle of the fourth century.

Having reviewed the principal discoveries which have taken place in the period 1850 to 1883, the lecturer expressed the hope that the next decade might be equally fruitful in the results of archæological research. There was one particular discovery which it was his earnest desire should be made. That was the revelation to the public of those interesting portions of the Townley and Elgin sculptures, which have been buried in the vaults of the British Museum since the year 1850,—*that is to say, during the entire period of the generation which has pursued archæological research with such zeal and success elsewhere.* He took this opportunity of publicly announcing that in October next he proposed to deliver at University College a course "On those Portions of the Elgin and Townley Collections in the British Museum which have been withdrawn from public view for many years."

[WE give a small view of the remains of the Djölbashi tomb (referred to above), and drawings of the greater part of the bas-reliefs, reproduced from Benndorf's work ("Archäologisch-Epigraphische, Mittheilungen aus Oesterreich, 1883"), by the kind permission of Herr Benndorf, and of Herr von Gerold, the publisher (see lithographed illustration). Casts of portions of the frieze, including the "parasol" (see top line of illustration) are among the contents of the new gallery of casts at South Kensington which will shortly be open to the public.]

* See p. 297, *ante*.

HOUSES IN FLATS.

ARCHITECTURAL ASSOCIATION.

WE extract the following from the paper on this subject read by Mr. F. E. Eales at the Architectural Association last week. The whole paper was useful and practical; but most of the information on the American and French systems, dealt with in the earlier part of the paper, has already appeared in one form or another in our pages.

We have not yet developed in this country our appreciation of flats sufficiently to warrant the building of these suites upon the extensive scale on which some are now being erected,—that is to say, with any likelihood of their being occupied, for the general applicant for a flat seems to be one who is willing to expend say 150*l.* up to 200*l.* in rent. In extremely good positions, of course, such as Piccadilly, Park-lane, and a few other expensive localities, fabulous rents might be obtained; in fact, in Piccadilly, I am informed that a suite of three rooms and bath-room on the first floor fetch 400*l.* per annum, and two rooms and bath-room on the second floor 200*l.* per annum. Another point, in considering these lofty buildings, is the absolute necessity of travelling by elevator, which, although delighted in by our American friends, yet not one person in twelve over here cares about much. The outlay required to provide an elevator,—say, to serve six floors,—is between 400*l.* and 500*l.*; the wages of an attendant and the water-rate would bring the annual expense to about 800*l.*; it is a question, therefore, unless a building is more than five floors above the ground, whether this means of gaining access to the upper regions is warranted,—for in a building of the number of floors mentioned the same rent can be obtained whether this additional accommodation is provided or not. Another drawback to excessive altitudes is the proportionate bulkiness of the walls, which, as you know, are regulated

in thickness by their height, the sacrifice of ground-area thereby, and the interference with free ventilation, and, most certainly, of light. Unfortunately, there is no restrictive power preventing a building going up to unlimited height in an old street which may be narrow into the bargain; but the 85th section of the Metropolis Local Management Amendment Act lays down the rule that no building in any new street of a less width than 50 ft. (except a church or chapel) shall exceed in height the width of the street without the consent of the Board of Works; in streets over 50 ft. in width there is absolutely no control as to height. The Metropolitan Building Act, however, carefully confines us to the superficial area, which, in the case of building flats becomes rather irksome. I allude to the 27th section, which will not allow you to build (if the area exceeds 3,600 square feet), without providing party-walls vertically and party-arches, and fireproof floors separating the different tenements. One of the essential points in the direction of these large buildings occupied by different families is, that they should be constructed of fireproof materials so far as is possible, and ready means of egress provided in case of necessity; so, perhaps the stringency of the Act in the way of precaution is not to be regretted. The most convenient form of plan for a site of ordinary dimensions is an elongated parallelogram, having front and back light; but it is so seldom that a straightforward piece of ground is to be had that it is rather futile to say what shape is most workable, as upon an ideal site an ideal plan could be arranged. A plan shown had 105 ft. frontage, with central entrance, the suites being entered right and left. Ample light is obtained both to back rooms and passages; this leaves three good rooms in front, consisting of dining-room, drawing-room, and best bedroom. The number of bedrooms mostly asked for is four, and in a family suite should be never less. To this add the kitchen and offices, bath-room, and two water-closets. This amount of accommodation seems to be all that is required by the ordinary applicant. The correct and best arrangement, where possible, is to have the bedrooms separated from the kitchen and servants' part by the reception-rooms. The kitchen should be in close proximity to the dining-room, for obvious reasons, and in these medium-sized suites it is well to provide a hatch between the two rooms, with small shelf, so that one servant may serve from the kitchen to the servant inside the dining-room. Some people are dreadfully frightened in case any smells of cooking should penetrate through this opening to the dining-room; but if properly attended to the danger of being objectionable can be overcome. The passages should be as wide as practicable, and never less than 3 ft. 6 in. clear, with light at end or side, so that the windows may be opened, and a current of fresh air admitted, and the whole suite kept pure and fresh. In these long frontages we must not forget that the Amendment Act comes upon us; until this came in vogue the Building Act, sec. 29, required only (as it does still in building upon old sites) an open area of 100 ft. super. in the rear or on the side of any dwelling-house unless otherwise lighted from a street or alley; but now, in the case of new sites, any frontage over 30 ft., according to the progressive scale laid down by the Amendment Act of 1882, must have an open space in the rear exclusively belonging thereto of 450 ft. super. If only six suites are required, a frontage of 37 ft. to 40 ft., and depth of 80 ft., will allow of a very workable plan. By having the entrance at the side you are enabled to obtain two good rooms in front, and keep the self-contained principle on each floor. In many buildings not only are the staircases dark, but the internal passages are without windows, or lighted from small well-holes. If you must have these wells, line them with white glazed bricks.

The staircase should be, as I have before mentioned, one of the first and principal points in a plan. How much more inviting is it to go into a building and find a bold, handsome staircase, well lighted, the stairs at least 4 ft. wide, of easy rise, the walls finished with some show of decoration, which, though not obtrusive, yet sufficiently attended to to give the visitor, as it were, an appetite for further exploration, than it is to find one's self, as in some cases, in a narrow, bare, dark, dreary passage, with a break-neck staircase, the walls simply distempered with a dark brown dado, or perhaps not even this, the hall finished with plain York paving, and everything as cheerless as could be desired. Surely a little money in this direction is well laid out. In the staircases of many of the new flats in Paris you will find the walls panelled, and lined with polished marble slabs, the treads of the stairs lined with white marble, and carpeted, leaving the impression that you are in some private mansion rather than one occupied by some dozen families. The stairs should, of course, be of fireproof material, as is required by the Building Act (sec. 22), which demands that every building containing more than 125,000 cubic feet, and used as a dwelling-house for separate families, the floors of the lobbies, corridors, passages, and landings, and also flights of stairs shall be of stone or other fireproof material. In the flats known as Hyde Park Mansions,* they have been carried out in Portland cement concrete; in some instances the treads are cast separately, and pinned in after the walls have settled, the landings being pinned in and carried by light iron girders; in other instances they have been cast in whole flights *in situ*. A mould of the flight is carefully made and supported by struts, a chace for the end of each step being cut in the wall, and, when ready, the mould is filled and allowed to stand some three or four weeks and then removed, leaving a very clean staircase. This method is cheaper than fixing the treads separately, on account of the labour required in fixing, this material being very heavy and rather difficult to handle. The cost of the latter process is about 12*l*. per single flight of twenty steps and landing, as against 20*l*. if fixed separately. The treads are finished with a fine face, and, when thoroughly dry, have a clean appearance. To add to the lightness, glazed tiles have been inserted in the risers, which relieves the mass of greyish colour and gives somewhat of a finish to the whole. Lining the treads and landings with marble makes an excellent finish so far as appearance is concerned, but it necessitates carpets being used, otherwise a good deal of slipping about would be experienced and some few broken bones to mend. It is a moot question whether it is advantageous to carpet the staircase, as from experience we find that with even the traffic in an ordinary dwelling-house stair-carpets soon become shabby, and so the question is whether is is not better to leave the stone or concrete, as the case may be, in its bare state, taking care to have the strings and margins painted and the remainder kept as clean as possible. The landings in the staircases of the flats mentioned are finished with tiles in some cases, in others with tesseræ, chips of marble, formed in patterns, which makes a clean and bright finish. In these flats I have endeavoured to add to the prominence of the staircase by providing a large landing on each floor, running from the stairs to the front of the house, with a glazed screen, in which can be introduced coloured glass, and which, if necessary, can be fitted up with settees or made useful in many ways, as well as being an aid to ventilation. Before quitting the staircase there is a point which also strikes me as being worthy of note, and that is the egress on to the roof. In almost every house you go into, you find that the way on to the roof is through a small trap-door in the top-floor ceiling, this averaging about 18 in. or 2 ft. square, scarcely large enough for a small man to get through, and very awkward for fleshy ones. After straining the muscles of your legs from standing on a rickety step-ladder (which is not always forthcoming), you get into the roof, and by this time in a filthy condition. You now come to another trap-door, which in all probability you will find bolted, the bolts being rusty and refusing to move. This said trap is covered with lead to make things heavier, and by the time you get this open would be time enough (if there should happen to be a fire going on) to have suffocated everybody anxious to get out. To obviate this inconvenience I always carry out the following arrangement:—From the top landing, form a narrow flight of stairs with handrail and balusters, leading to a landing at top, and with a sufficient headway to stand up, say 7 ft., formed as a dormer to the roof; unlock the door and you are out, either in a gutter or on a flat, without trouble, inconvenience, or dirt, besides yielding an opportunity for householders to take a survey of their tiles or gutters and make themselves acquainted with what one in a thousand never troubles his or her head about. The buildings in question are furnished with high-pitched roofs, with collars, leaving ample room to form cubicles, with a central passage: these are devoted to each tenant as a box-room, and are most convenient; the door leading to this part is shut at a certain hour, and each tenant is under certain responsibilities as to usage.

Secondary Stairs.—Most of the plans we have seen this evening have a secondary staircase provided for the use of servants, and it is essential that there should be a method of tradesmen communicating with the kitchens without using the principal staircase. There are many objections to its use, as being an incentive to misbehaviour on the part of domestics, as also a loophole for servants of other suites congregating and becoming a nuisance in more ways than one. The plan adopted in Hyde Park Mansions is to have a lift, say, 3 ft. by 2 ft. 6 in., serving each kitchen from the basement; and as the kitchens are all at the rear, the lift is out of the way. At the basement level is a pair of folding-doors open, and the lift is exposed to view. On one side of the opening is a list of the tenants with their respective suites, number, and floor, and a speaking-tube to the kitchen of each. The tradesman comes with his order, whistles to the cook, say, of No. E 2nd floor; she replies, the man puts his basket or what not in the lift, and pulling the rope the lift arrives at its destination, and when emptied comes down again to the basement. This arrangement has been in work some three years, and answers well enough at any rate for a substitute to the secondary staircase, — which means space, expense, and possible annoyance. There should be two water-closets to every suite; one can be in the bath-room,* if space is to be economised, and the other in the neighbourhood of the servants' part, and if possible, with a lobby to same open to external air. Be careful not to place a water-closet just as you enter the flat; contrive it where it will not be obtrusive, and by all means with a window to external air. All the soil-pipes should be carried down outside, and left open at top, and trapped at bottom; and be careful that any repairs to a tenant's pipes can be rectified from his own premises, without having to go into the suite above or below, as the case may be. Ventilate each apparatus by a pipe going up to the roof, deliver the rainwater pipes open on to siphon traps, turning the wastes from lavatory and bath into them; this simple system answers as well as can be wished. In the flats alluded to, we have a constant supply served by a 1½-in. rising main, running from bottom to top of building, with branches on each floor to suite and cisterns, with a draw-off at sink from the rising-main, and one from a cistern; the precaution for the two draw-offs being in case the constant supply should be stopped by reason of repair or accidents, when the supply can be obtained from the cistern in reserve. Each water-closet has a separate cistern. The baths are served with hot and cold, with circulating pipes from kitchen boiler in each instance; the lavatories being supplied from same source. This method of supplying hot water, totally distinct in each suite of rooms, is by some considered more agreeable than having furnaces in the basement, which supply the whole building, which in the case of medium-sized flats would be hardly of sufficient advantage to warrant this outlay. It is customary when there are furnaces, to have hot-air flues in the staircase walls, with hit-and-miss gratings, so that the hot air may be regulated both on the staircase side, and also in the private hall of each suite. It is only in the winter months, however, that the staircase requires warming, and when there is a plentiful supply of gasburners, which in the dark months are brought into requisition in the early morning and afternoon, the staircase becomes warmed without the aid of hot-air flues; this is the case in staircases which are 14 ft. by 10 ft.

Ventilation.—When the windows open to the open air, and each room has a fireplace and ventilator communicating with external air, there is every chance that the rooms may be kept fresh without calling in the aid of shafts and tubes and elaborate experiments which generally end by blowing one's head off, or being stuffed up to spite their inventor. To aid the idea of independent ventilation in these

* Illustrated in the *Builder* for August 4, 1883. Oxford and Cambridge Mansions, also by Messrs. Eales & Son, were illustrated in the *Builder* for February 3, 1883.

* We are surprised to find any architect recommending such an arrangement, even as an economy of space. It is most disagreeable, unsuitable, and uncivilised, and should not be allowed.—ED.

buildings, the windows in most instances are carried out in the following manner:—The top sash is made to hang, and finished with casements underneath, which, when there is a balcony provided, are of much more convenience than the double-hung sash. By this means the top sash is opened at pleasure, and in the summer the casements can be thrown open, thus gaining the advantages of each. Following on ventilation we come to the means of getting rid of the dust and rubbish accumulating daily. This is done by making use of a flue provided in the neighbourhood of each kitchen, fitted with an iron door and cheeks, with india-rubber rabetted rim, so that it may be kept air-tight. This flue communicates direct to the basement, where there are large receptacles sunk below the yard level which are emptied twice a week. This saves a great deal of trouble in carrying the refuse down or sending it in the lift. The place is thus kept sweet, and the process of collecting being carried out in the early morning, does away with a possible nuisance.

Internal Finishings.—The two principal rooms should be so arranged that they can be thrown into one, as occasion may require, which can be done by one of three ways: by having folding doors, sliding doors, or revolving wooden shutters. The drawback to the first is that so much room is taken up when folded; the second destroys the walls; and the last is cumbersome, as the boxing must show below the ceiling line, and when finished looks anything but well. The Americans patronise the sliding doors, which is certainly the most convenient arrangement. The rooms should not be too lofty, on account of the expense, unless the duplex system is required, when it necessitates having the front rooms 14 ft. at least, the average height for the best floors 11 ft., finishing with 9 ft. at top. This height enables you to get ample window light. The interior of rooms is improved by introducing bay windows, either circular, splayed, or square: the preference is generally given to the circular. These windows, as well as tending to the appearance internally, help to break a monotonous elevation, especially if balconies are provided to the principal rooms,—a feature which forms a substantial item towards letting purposes. These balconies give the tenant (if he is some distance up from the earth) the opportunity of feasting his eyes upon flower-boxes, which will not only make his own rooms pleasant, but will make up to him partly the lost pleasure of seeing what is going on in the lower regions, which, at the second floor of a lofty building, he could not do unless standing on the balcony. The principal rooms should have speaking-tubes provided, communicating with the kitchen, which should be fitted with as many cupboards as can conveniently be obtained. The coal-bank need not be large, as it can be replenished from the vaults in basement which are allotted to each tenant. The larder should be placed so as to get external air; all the necessary fittings for kitchen and scullery purposes provided. Each entrance-door should have number, with bell, with letter-box, and private latch to door. In place of the French *concierge* or the American janitor, either of whom requires two rooms at least allotted to him, and either of whom is an expense, twe have substituted a small tablet in the entrance-hall of each block of flats. A neat tablet is fixed on each side of the entrance-hall, with the names of the tenants printed thereon, with their corresponding number or letter and floor. In a line with the name is a slip with "in" or "out," which can be manipulated at pleasure, enabling the tenant to let any caller know if he is within or not, thereby saving the visitor the trouble of travelling up the staircase, perhaps to be disappointed. As each suite is entirely self-contained, with a separate entrance-door, there is no necessity to lock the main entrance-door, which can be opened by any one up to a certain hour, after which each tenant uses a pass key. This arrangement meets every requirement. If any special inquiry be needed, the applicant simply adjourns to the manager's office, or consults porters, who patrol the buildings without intermission day and night, who are more alert, and therefore more useful as custodians, than the *concierge*, who remains at his post as a fixture. With the exception of gas (each tenant having a private meter), everything is provided in these flats, the use of telephone included, the tenant simply paying his quarterly rent.

It would be a mistake to pass over a point connected with flat-building which has forced itself upon the notice of many, especially as we are now considering the propriety of developing buildings arranged in flats. I allude to the extensive and expensive buildings which are now going up arranged as flats, for which rentals must be paid to recoup the investor larger than there is any likelihood of obtaining. A man of ordinary income thinks, upon seeking a house, that a rent of 150*l.* per annum is (and he is right) a sufficient sum to pay for being housed; add to this another 50*l.* for rates and taxes, making roughly 200*l.* per annum. How many men can afford to pay this sum in rent? Those who can mostly prefer having a house to themselves rather than a flat; yet we see and hear of suites starting at rents of 500*l.*, and going up to much larger figures. This is a mistake: those who require flats are those enjoying moderate incomes, and require to economise what they have. If suites can be obtained from 100*l.* to 150*l.*, then the new system is likely to be patronised; but so long as buildings are erected in an extravagant manner, regardless of what people are able to pay, then surely some of these undertakings which are now in hand will stand idle.

[Some notes of the discussion that followed the reading of the paper are deferred until next week.]

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

MEDALS AND PRIZES, 1884.

AT a special general meeting of members, held on Monday evening last, Mr. Horace Jones, President, in the chair, the principal business was to consider the award of the Royal Gold Medal and other medals and prizes for the present year.

The Royal Gold Medal.—The following resolution, moved by the President, was carried by acclamation, namely,—"That, subject to her Majesty's gracious sanction, the Royal Gold Medal for the year 1884 be presented to William Butterfield, architect."

The Tite Prize (value 30*l.*). Subject: Entrance Hall and Staircase of a Royal Palace. (Eight competitors.) Awarded to the author of the design bearing the motto "Floreat R.I.B.A." (Mr. Edwin William Poley, of 46, Lady Somerset-road, Highgate). In the same competition a Medal of Merit and the sum of ten guineas were awarded to the author of the design bearing the motto "Never venture, never win" (Mr. John Alexander Campbell, of Glasgow, and 4, Rue Saint-Roch, Paris).

The Grissell Gold Medal.—Subject in iron construction.—Central Hall of a Fruit and Vegetable Market. The Secretary announced that no design had been submitted for this medal.

The Soane Medallion and 50*l.* — Subject, a Theological College for Thirty Students (eight competitors). Awarded to the author of the design bearing the motto, "Sedes sapientiæ" (Mr. John Oliver Harris, of 83, Orlando-street, Bolton-le-Moors). In the same competition a medal of merit was awarded to the author of the design bearing the motto "Dignitas" (Mr. Herbert Osborn Cresswell, of 19, Queen Anne's-gate, S.W.).

The Institute Medal and Ten Guineas: Drawings. Measured drawings of old buildings. (Six competitors.) Awarded to the author of the design bearing the motto "Thistle" (Mr. Andrew Whitford Anderson, of 46, Warwick-gardens, Kensington), for his drawings of Elgin Cathedral. In the same competition it was also resolved that the Institute Medal be awarded to the author of the design bearing the motto "Je persévère" (Mr. Arthur Needham Wilson, of 23, John Dalton-street, Manchester), for his drawings of West Walton Church, Norfolk; and that a Medal of Merit be awarded to the author of the design bearing the motto "Nil Desperandum" (Mr. John Robert Sutton, of 6, Checker-street, King's Lynn, Norfolk), for his drawings of Terrington St. Clement's Church, Norfolk. Further, that a Certificate of Honour be awarded to the author of the design bearing the motto 'Εσπουδασά (Mr. Arnold Bidlake Mitchell, of 36, Pembury-road, Clapton), for his drawings of Shottesbrooke Church, Berkshire; and that a Certificate of Honour be awarded to the author of the design bearing the motto "Effort" (Mr. Henry Downs, of 2, the Elms, Beverley-road, Hull), for his drawings of the south transept of Beverley Minster.

The Institute Medal and Ten Guineas: Essays.—Subject, "Staircases." (Four competitors.) Awarded to the author of the essay bearing the motto "A vaillans Cœurs rien impossible." Mr. Thomas Purves Marwick, Associate, 1, Spottiswoode-street Edinburgh.

The Building of Town Houses.—Mr. Edis delivered the third and last of his series of Cantor Lectures on this subject in the Hall of the Society of Arts on Monday evening last. We are obliged to hold over our report until next week.

THE HOSPITALS ASSOCIATION.

THE first Council of the Association has been constituted as follows:—

Vice-Presidents. — The Right Hon. Lord Aberdare, F.R.S.; Sir T. Fowell Buxton, Bart.; Sir Andrew Clark, bart., LL.D., M.D.; Major Ross, M.P.

Council.—The Right Hon. the Earl of Cork and Orrery, K.P.; Viscount Powerscourt, K.P.; Sir Rutherford Alcock, K.C.B.; Mr. H. W. D. Acland, M.D., C.B., D.C.L., F.R.S.; Mr. William Bousfield; Mr. J. S. Bristowe, M.D., F.R.S.; Mr. Henry C. Burdett; Mr. J. H. Buxton; Mr. M. D. Chalmers; The Rev. Canon Erskine Clarke, M.A.; Mr. Frederick Cox; Mr. W. H. Cross; Mr. H. N. Custance; Mr. R. Farquharson, M.D., M.P.; Mr. Timothy Holmes; Mr. R. Benson Jowitt; Mr. G. B. Lloyd; Mr. R. H. Lloyd, M.D.; Mr. Charles Macnamara, F.R.C.S.; Mr. Malcolm Morris; Mr. C. T. Murdoch; Mr. William J. Nixon; Mr. Richard Quain, M.D., F.R.S.; Mr. T. Gilbart-Smith, M.D.; Mr. Joseph White, F.R.C.S.

It is proposed that the evening meetings of the Association shall be held on the third Wednesday in the month. The first, however, will take place on the 26th March, when a paper will be read by Mr. William J. Nixon, House Governor of the London Hospital, on the "Difficulties associated with the Administration of the Out-patient Department, and how best to deal with them." The meetings will, probably, be held at the Rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, the chair being taken at 8 p.m. Persons desirous of being present at the Evening Meetings, or of becoming Members or Associates, are requested to communicate with the Secretary, Mr. J. L. Clifford-Smith, at the Office, No. 1, Adam-street, Adelphi, who will gladly forward the necessary forms of application.

EXHIBITION TO ILLUSTRATE THE OPERATIONS AND INFLUENCE OF SCHOOLS OF ART.

WE have received from the Committee of the Science and Art Department a circular stating that they consider that it will be of advantage to the art education of the country if an Exhibition of Works of Art Manufacture designed and executed by students of Schools of Art be held during the present year, in connexion with and forming part of the International Exhibition at South Kensington. All articles exhibited must be the work of past or present students of Schools of Art, or executed from designs by such students, the works themselves having been executed since the year 1862. The articles must be certified by the manufacturers, by the Master of the School of Art in which the student has received instruction, or by the student himself. The name of the manufacturer, of the School of Art, and of the student will be published. The decision as to the acceptance of any work for exhibition will rest entirely with the Committee of Selection.

The works must be sent to the Department on or before the 31st of March, addressed to the Secretary.

The following is the classified statement as to the nature of work that will be admitted:—

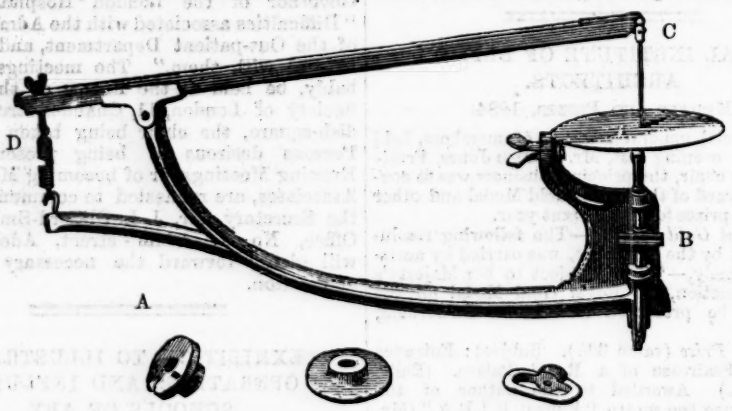
1. School studies in stages of instruction. Designs and models executed by the students in the schools. The latter will be placed with the section to which they belong.
2. Ceramic manufactures, porcelain, earthenware, stoneware, terra cotta, &c.
3. Glass,—cut, engraved, flashed, pressed, &c. Stained and painted glass in windows or panels.
4. Enamels on metal. Cloisonné. Champlevé, &c.
5. Ornamental metal-work,—bronze, brass, iron cast or wrought. Drawings and photographs of such works as may have been executed.
6. Silver and gold plate, plated wares, electro deposits, including models for silver and gold work. Drawings and photographs of such works as may have been executed.
7. Jewellery and personal ornaments,— gold, silver, plated, or in any other suitable materials.
8. Furniture and wood carving. Inlaid wood. Parquetry. Papier-mâché ware, &c.
9. Decorative carvings in stone or marble.
10. Lace—point, pillow, and machine-made lace. Drawings and photographs of such as may have been executed.
11. Woven damasks in linen and cotton, plain or in colours.

12. Silks, ribbons, trimmings, &c., including furniture and dress fabrics.
13. Mixed woven fabrics for dresses, shawls, scarfs, &c.
14. Printed fabrics.
15. Carpets and tapestry—curtains, table-covers, &c.
16. Painted decorations, wall-papers, &c.
17. Lithographs, chromolithographs, &c.
18. Illuminations. Illuminated addresses. Title-pages of books. Bookbindings, &c.
19. Etchings, engravings on wood, and drawings for engraving.
20. Painted photographs of objects of decorative art.
21. Architectural drawings, designs, and models of buildings.
22. Miscellaneous. Articles not included in any of the above divisions, but yet coming within the object of this Exhibition.

FRET-SAW ARM FOR LATHE.

THE engraving illustrates a very useful adjunct to a lathe. The frame is constructed to fit on any ordinary lathe-bed, by means of the usual bolt or ring nut to go under the bed of the lathe.

A driver or catch-plate (A) fits on to the nose of the lathe-mandril with a pin or roller, which works in the cam B, which is fixed to the saw-



bar. By working the lathe a rapid vertical motion is given to the saw.

A screw clamp at the upper end of the saw-bar fastens the lower end of the saw. The upper end of the saw is attached by a clamp to a pivot piece fixed on the arm C. The arm is of wood, and takes in work 16½ in.

The table is made to tilt for cutting at any angle, or for inlaid work.

THE CATHEDRAL (R. C.) OF WESTMINSTER.

WE extract the following from the *Tablet* of the 1st of March:—

"Some time ago we explained in considerable detail how the site for the new Metropolitan cathedral was to be acquired: first, by the Westminster Land Company (Limited), from the Middlesex magistrates, to whom it had been reconveyed by the Crown, and then, mainly through exchange of land, by the Cardinal Archbishop from the Westminster Land Company. All these transfers have now been formally completed. Last week the prison and its site were legally conveyed by the Middlesex magistrates to the Westminster Land Company, and the same day the exchange of land between the Cardinal Archbishop and the company was effected. The see of Westminster is, therefore, now in full legal possession of the site of its future cathedral. The first thing to be done now is, of course, to clear away the prison buildings; the sale by auction of the materials is to begin on the 10th of March, and the buildings, according to contract, will have to be pulled down and removed in five months. We understand that the definitive plans for the cathedral will shortly arrive from Vienna, and that the principal modifications of the late Baron Ferstel's original designs are that the church will be lengthened, so as to give more room for a canons' choir, and that it will be raised in height by the introduction of a triforium below the clearstory. The dimensions are, as we mentioned before, 550 ft. in length from Ashley-place to Francis-street, and 300 ft. in width from Morpeth-terrace to the eastern limit of the cathedral ground. The Middlesex magistrates, who have, through their clerk, acted with the utmost loyalty and good feeling throughout the whole transaction, have, it seems, a 'sentiment' for a particular small gateway on the Ashley-place side of the enclosure, a gateway which is surmounted by a glass case containing the keys of the old prison. This gateway and its appurtenances have, accordingly, been presented to the magistrates as a souvenir by the Westminster Land Company."

WESTMINSTER ABBEY:

THE PROPOSED NEW "SOUTH TRANSEPT."

SIR,—As Mr. James Fergusson has, in your last issue [p. 320], given me a friendly challenge, I must ask your permission to reply, and must crave your indulgence if my reply be somewhat at length. The importance of the subject is a sufficient excuse.

Mr. Fergusson very frankly admits that he does not speak from personal knowledge of some of the remains he would destroy, but is satisfied to trust the Ordnance Survey. At what date the survey was made, or what were the qualifications of the surveyors in the way of architectural archæology, he does not say; but it is innocently presumed that every one must accept such evidence as conclusive.

The careful student, as I hope to show, would not do well to base his information on this survey only, excellent as it may be. One would have supposed that the plan in Sir Gilbert Scott's "Gleanings from Westminster Abbey," or that of later date, and in fuller detail accompanying Mr. J. T. Micklethwaite's paper, on the Abbey Buildings, and published in the *Journal* of the Archæological Institute, 1876, would have been better worth consulting. The buildings themselves might also have proved worthy of an examination.

As Mr. Fergusson takes exception to several points in my letter, in detail, and rather flatly contradicts me, I must also go into detail.

And first, with regard to the Infirmary Hall, which now forms the entrance to one of the Minor Canon's houses. Here my opponent is quite wrong. His ideas, based on the infallible Ordnance Survey, are exactly opposite to the facts.

It is the northern end of the hall which is *not* quite intact. From the little cloister it can be seen, without entering the house, that the gable is modern. The lower part of this wall is, however, old, as is all the rest of the hall.*

Mr. Fergusson is next "puzzled" by my "detailed plan and description of St. Catherine's Chapel." Why did he not look for himself? How long since was it that he gave his so hurried a peep on the ill-kept garden?

As a matter of fact, of this chapel, of which "nothing is now visible on the site above the ground level," the three eastern arches of the south arcade remain entire up to the wall plate. The column next the west wall stands complete, minus its arches; the bases of the columns on the north side are all *in situ* (the western base is not visible, being under the floor of a room); the lower part of the altar is *in situ*, and parts of the walls. A dwelling-house is built on the foundation of the north wall. Mr. Fergusson does not propose to interfere with the "slype." His plan, however, shows the ancient eastern wall removed to make way for the west wall of his transept. This sort of noninterference speaks for itself. In his plan, the houses on the north side of the little cloister were not shown; the presumption, therefore, was just. They were to be destroyed.

He tells us that he "is not aware of any historical or other local interest that attaches to the infirmary buildings of the Abbey." Is there no interest in the place in which the consecration of St. Hugh of Lincoln in 1186 took place; in which many provincial councils were held, and in which happened the famous contests for precedence between the Archbishops of York and Canterbury; and in which the great Charter of England was finally confirmed in 1225. Does Mr. Fergusson expect to find these facts noted on the Ordnance Survey?

Again, his statement with regard to the two new houses in the College-garden is wrong in every respect. By the fact that Westminster School became possessed of Ashburnham House and the house adjoining it on the east, two of the canons were, simply, left houseless. The construction of two new houses was no matter of choice.

I need not say more to show that my objections are not so very "irrelevant," and that in matters of fact Mr. Fergusson is wrong in nearly every particular.

With your permission, however, I would venture a few criticisms upon the "new south transept" itself, as explained by Mr. Fergusson's plan and letters. The building would be, we are told, very much lower than the Abbey, viz., about 100 ft. to the ridge of the roof. A walk through and around the precincts of the Abbey will, it may be supposed, convince most lovers of the place that a great roof ridge, 180 ft. long, and at the level of the clearstory parapet, would utterly ruin the group, the chief beauty of which lies in the contrast between the lowly clustering of the domestic buildings and the lofty church towering above them.

Then the extreme largeness of parts, as shown in the plan, of the suggested transept, is directly at variance with the general setting-out of the Abbey, where the only excessive dimension is height. The new structure would give a wider nave, wider aisles, and generally a fewness of parts, which, especially in internal effect, would be poor, and in extreme opposition to the general feeling of the building to which it should be a subordinate adjunct. The nave of the Abbey is in width but a little over 40 ft. from centre to centre of the columns. The aisles are from the centre of the columns to the wall face some 15 ft. or 16 ft.

The "new south transept" would be more than 50 ft. from centre to centre across the central part, and its aisles are shown as each about 25 ft. wide. We should thus pass from the lofty and rather narrow Abbey into a place having in excess the broad, empty, and somewhat straddling aspect of the nave of Lincoln. Although the new work would unquestionably be very inferior, it could not fail to have a detrimental effect on the Abbey.

I venture to think, however, that Mr. Fergusson's idea of the timber roof is not the least objectionable part of his scheme. He tells us that he had in his mind the beautiful roof which once adorned St. Stephen's Chapel, hard by. He recommended a "restoration" of it. But what was it? The difference of opinion in this matter is well expressed in Brayley & Britton's book on the "Ancient Palace at Westminster:"* "Of the form, position, and ornaments of the original inner roof, or vaulted ceiling, there is much difference of opinion amongst architectural antiquaries; some contend that it was of stone adorned with tracery; whilst others assert that it was formed of timber arranged in many panels, and enriched with colour painting and gilding. One or two architects insist that it had a clearstory above the present finishing cornice, and that consequently it must have been very lofty."

It must not be forgotten that this was written shortly after the fire, by men well versed in the study of our ancient buildings, and when the evidences,—whatever they were,—remained.

Mackenzie's engravings show a most elaborate wooden roof† and a clearstory. Be this as it may, how would this roof, suited to an aisleless building of about 33 ft. span, be "restored," and yet fitted to an aisled building of some 50 ft. span?

It is but fair to the Mediæval architect to suppose that he designed his roof to suit the building it was to cover. A mere imitation of this roof, whatever it may have been, to a different scale, and on a building of a totally

* I was in error in my letter of February 16th [see p. 284, *ante*], in saying that this hall was quite complete. I had forgotten the alteration, made by Sir G. G. Scott, to the north gable.

* "The History of the Ancient Palace at Westminster," by E. W. Brayley and J. Britton, 1836, p. 452.
† Mackenzie, F., "The Architectural Antiquities of the Collegiate Chapel of St. Stephen, Westminster." 1844.

different character, would, in fact, be simply ridiculous.

As a matter of carpentry, the framing of trusses to span 33 ft. should not be the same as those to span 50 ft.

I have not exhausted the subject, but must not trespass more on your space.

SOMERS CLARKE.

No. 15, *Dean's-yard*, March 3.

SIR,—Mr. Fergusson's letter in your last week's issue deals with Mr. Somers Clarke's objection to his proposed transept in a rather astonishing manner, stating, on the authority of the Ordnance map, that St. Catharine's Chapel has no existence beyond obscure traces intelligible only to the archæologist. How Mr. Fergusson can have failed to see the very obvious remains of the chapel, even on the most cursory inspection, I cannot imagine.

Not only is the plan of the whole quite clear, but portions of the walls all round stand above ground, and the south arcade is almost complete, as well as two of the south aisle windows. I am quite satisfied that Mr. Fergusson would be the last to wish to see such interesting remains as these destroyed.

But there is surely an artistic as well as an antiquarian objection to his proposed transept. He claims for it that it would appear an actual part of the Abbey, continuing its south transept 250 ft. further than its builders intended. What could be more destructive of the beauty and symmetry of the Abbey than such an addition to its perfect design? Imagine a transept 250 ft. long, 20 ft. wider than the Abbey nave, and "very much lower"! It could only be a huge ill-proportioned mass,—"monstrum horrendum, informe, ingens." Its position, too, would be such as to prevent any good view of the Chapter-house.

On the other hand, the design prepared by Sir Gilbert Scott does not pretend to be any actual part of the Abbey, though it would stand in the closest connexion with it, and be in harmony with the design of the Chapter-house and other parts. Mr. Clarke speaks of this plan also destroying some of the old buildings, but this is a mistake. It is carefully kept clear of the Abbey precincts, touching nothing except the southern part of the boundary wall.

J. OLDRID SCOTT.

SIR,—Having noticed diverse opinions expressed in the correspondence relating to the proposed "Campo Santo" at Westminster Abbey, as to the extent of the remains of the ancient Infirmary Chapel of St. Catherine, I venture to supply a few facts thereon. As foreman of works to all the restorations at Westminster Abbey for the past seventeen years, I became intimately acquainted with numerous interesting discoveries made during that time, including the bringing to light of the entire plan of the above chapel. Previously to 1871 the west entrance, south aisle columns and arches, and portions of the south wall, were the only visible or known remains of the chapel; but in that year the old receiver's house was cleared away, and in digging the foundations for the new house and office we came upon the outside of the north wall of the chapel; and in carefully uncovering and pursuing the remains we discovered the whole of the north aisle, detached bases, and portions of columns *in situ*, and corresponding exactly with the intact ones on the south side, thus giving the total length and breadth of the nave and aisles.

We also found the raised altar space, and here and there the beds of the ancient floor, but no tiles. The whole area of the nave and north aisle, which for a great number of years had been covered with rubbish and mould several feet deep, and used as a garden, was then carefully excavated down to the ancient floor line. All the remains are to be seen externally, except a base or two covered by the flooring of the new office. These are accessible through a trap-door.

JAMES HILLMAN.

DERBY ASYLUM COMPETITION.

SIR,—The conditions of the above have been issued to, I believe, about 150 applicants. In them there is no mention of either a preliminary competition or of a professional arbitrator on the plans, both of which are advocated by the new rules agreed on by a committee on the subject, and endorsed by the Royal Institute of British Architects.

There is plenty of time for all intending competitors to urge the Town Council of Derby to adopt the principle, and appoint an arbitrator, and I should be glad, through the medium of your paper, to ask your readers to write individually to the Town Clerk at Derby, or to sign petitions, which I have no doubt each editor of the professional papers would allow to lie in his office for a week, and would then undertake to forward to the Town Clerk at Derby.

R. STARK WILKINSON.

MECHANICAL AIDS TO SCULPTURE.

SIR,—Permit me through the medium of your paper to thank Lieut.-Col. Crozier [see p. 320, *ante*] for introducing me to a machine with which I confess I was not acquainted. I think, however, that Col. Crozier somewhat mistakes the point at issue. I do not deny that many machines have been made, all more or less on the same principle, which have been successful in the reproduction of copies, on a very small scale, from an original model; neither do I claim to be the original inventor of novel mechanical movements or mathematical principles. These latter must remain the same in all instruments of this class. It is, however, a fact that none of these machines have ever produced satisfactory work on a large scale. I have already mentioned the two chief causes of error. I do not think that a self-acting carving-machine would be of advantage either to art or to artists, even were such a machine possible. We desire that our labour should be lightened for us, as far as the mechanical part of it is concerned; but he would be a feeble artist, indeed, whose work could be done for him by any machine whatever. My instrument is a proportional pointing instrument, and not a copying-machine, and performs work which, as far as I know, has not been successfully attempted by any other instrument. In conclusion, I can only say that if Col. Crozier cares to see it I shall be most happy to show it to him.

GEORGE SIMONDS.

152, *Buckingham Palace-road*,
March 4.

LEASEHOLD ENFRANCHISEMENT BILL.

SIR,—The proposal that every tenant of urban property should be enabled to acquire the fee simple by compulsory purchase would in one way act very injuriously,—I mean by depriving residents of the security they at present enjoy (by virtue of the usual covenants in leases of private houses) against the carrying on, by any of their neighbours, of any such trade or business as might spoil the residentiary character of the locality, and thereby, of course, diminish the value of the houses therein.

It seems to me that all that is wanted is an Act providing that "In every case where a lease is granted in consideration of the expenditure by the tenant of any sum in buildings or other improvements on the premises, the tenant shall be entitled to require a renewal of his lease for such a term as would, with the term originally granted, make up a term of such length that, for every year's rent expended on the premises by the tenant he should have three years' enjoyment of the premises." Thus if the ground-rent were 5*l.* and the amount to be expended 500*l.*, the tenant would be entitled to a lease for $\frac{500l.}{5l.} \times 3 = 300$ years. This would involve no expensive arbitration or investigation of title, and would, I think, answer every useful end.

W. A. L.

THE VENTILATION OF THEATRES.

SIR,—I was present at the Parkes Museum on the 12th of February, and heard Mr. Seddon's paper on the above subject. [See pp. 225, 282, *ante*.] I entirely agree with all that he said, but it struck me as being somewhat strange that a system of ventilation that has been before the world for more than thirty years should now require to be advocated as if it were quite new.

Has there been neglect or ignorance in persons usually consulted upon ventilating schemes, or a desire for half-measures on the part of those requiring them, or neglect on the part of the public in failing to demand improvement? I was glad to hear that Mr. Seddon went in for a thoroughly comprehensive system for every part of the theatre.

Unfortunately for the cause of efficient ventilation, our plays and actors have for the last few years been so good that the public has been almost forced to the theatres, even to the damage of its own health; one is almost tempted to wish that they were left without profitable audiences until some improvement was effected.

That Mr. Seddon's system would secure this I have no doubt, and the expense, particularly in a new house, would not be such as to prevent any judicious manager adopting it.

The attempt to ventilate a theatre by an upcast shaft from the roof, while the motion of the air is prompted by fans or exhaust-pump ventilators, or by sun-lights, without any proper openings for the admission of fresh air, must fail; and if proper inlets for pure air are provided, the failure in point of comfort to the audience will be more apparent; for if you rely upon the draught of the upcast shaft to secure a passage of air through the building, the pure air will be violently pulled through some of the openings, and other parts of the house will be left without any supply at all; consequently those persons sitting near the active openings would condemn the whole system, as also would the others; for, though feeling no draught, they would suffer as much from the want of pure air as now.

If Mr. Seddon's scheme (which is really a revival of the late Dr. Reid's principle) were fairly carried out, a pressure would be put upon all the air in the mixing-chambers and delivery-ducts, which air, after having been filtered, washed, cooled, or heated, would be driven into the house through appointed openings, each of which must take the quantity intended. I would suggest that a difference be made in the points of supply of heated and cooled air; the former should be delivered somewhere in the risers of the seat spaces; the latter should enter above the heads of the audience, and I would in some cases provide for a wall or curtain of pure air to rise as a division between some parts of the house.

There would be one more advantage in Mr. Seddon's system which he did not mention. It is this. If pure air is forced into the house, not drawn, it would be easy, upon the fall of the curtain, to close the spent-air exits. Then, upon opening the doors, the air of the house would flow into and fill all the corridors and staircases with a stream of pure and tempered air, and the departing visitor would, as it were, be wafted upon a congenial breeze, feeling no change of temperature until actually outside the theatre. At present all, and especially ladies thinly clad, have to face a strong blast of cold air rushing from the street into the heated house: this causes many colds, much personal suffering, and also considerable loss to the treasuries of the theatres.

HENRY H. HAZARD.

PIPES *v.* FAÇADES.

SIR,—Many will sympathise with the remarks by "Belsize" on p. 285, and if it is to be understood that ventilating blow-off pipes for sewers or drains are to be fixed up outside buildings, it is but right that architects should make provision that they be as little of an eyesore as possible. This, however, must principally apply to new structures. In regard to buildings already erected it is often no easy matter to put up the ventilating blow-off pipes without being an eyesore, and only this week an architect and myself were considering how best to do so upon a very fine building.

In regard to putting up blow-off ventilating pipes for the sewer or drain at the front of a house facing the street, this pipe may have to go up either on the outside or inside of the front wall. If the pipe is to be used for ventilating the drain beyond the disconnecting-trap and also the sewer I have been hitherto opposed to it being placed *inside*. In that case some decidedly object to it being placed outside on account of the disfigurement of the frontage, so that the question is forced upon plumbers and sanitary engineers how to put up a ventilating-pipe for the sewer inside the front wall with complete safety to the occupants or users of the building.

I think this might be done by using a strong cast-iron pipe, ½ in. or so thick, painted with red lead both inside and outside, and the joints run with lead; or malleable iron pipes might be used, ⅜ in. thick, also painted inside with red lead, but with screwed joints. Instead of being holdfasted to the wall, these pipes might be supported by strong malleable iron spikes with half-circle band attached, and then loose half-circle band screwed on to fix the pipe. A few feet out from the wall a large stop-cock might be put on underground, and inside of it an access opening made to enable the pipe inside of the building to be easily tested for leakage, and also, if desired, a disease-germ filter might be put on near the access opening to keep out disease germs from passing up the ventilating-pipe inside of the building, while yet allowing free passage to the air. This notion or plan is my latest contribution to sanitary practice in the drainage line. The material to be used in these sewage-air filters may be asbestos, cotton, or other suitable fibrous material. The Commissioners of Patents, under the new Patent Law, have granted provisional protection for the plan, but there has not been sufficient time yet for proper practical experiments being made; but I may refer to such at a future time.

W. P. BUCHAN.

P.S. It must be understood that there are no branch connexions into this pipe inside of the building.

RE ARBITRATIONS.

SIR,—In the report of a case in the Court of Appeal, Fraser *v.* Ehrensperger, reported in the March number of the *Law Journal*, confirming the case of Meier *v.* Rouse, it appears to be now clear that without the words "this submission to be made a rule of court" in the agreement to refer, either party may retire from the agreement at any moment up to the making of the award. In other words, each party agrees to refer the dispute to arbitration so long as he and his opponent remain of the same mind; an arrangement which is very far from being business-like. It would appear from this that the arbitration clauses in building contracts as at present drawn are capable of being made abortive at the instance of either party.

As this is a matter of great importance, it occurred to me that it is not possible to give too great publicity to the decision.

HERBERT D. APPLETON, A.R.I.B.A.

157, *Wool Exchange, E.C.*

BELGIAN GRANITE.

SIR,—I should be obliged if any of your correspondents could inform me of what stone the new Palais de Justice at Brussels is built? I have heard it described as "Belgian granite," but it has much the appearance of being an artificial stone. If the latter is the case, how is it made?

WILLIAM STAGG.

[*Canon's Marsh, Bristol.*

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

Feb. 22.- 3,737, C. Cooper and W. Cooper, Great Crosby, Manufacture of Bricks.—3,741, J. Parker, Birmingham, Door-locks.—3,754, H. Conolly, London, Water-closets.—3,755, H. Conolly, London, Water-waste Preventer.—3,756, W. Johnson, Plumstead, Venetian Blinds.—3,763, C. Allen and W. Allen, Holmes Chapel, Horticultural Buildings.

Feb. 23.—3,814, W. H. Tylor, London, Draintraps.—3,846, W. J. Mason and G. Swann, London, Heating Apparatus.

Feb. 25.—3,873, J. Powell, Belfast, Concrete.—3,878, J. Smeaton, London, Water-closets.—3,908, J. Leedham, Sheffield, Ashpan for Fireplaces.

Feb. 26.—3,913, W. Devott, Erdington, Flushing Water-closets, Drains, &c.—3,923, A. A. Carter, Rotherham, Stoves.—3,945, E. Robinson, Dukinfield, Ventilating Rooms.—3,971, E. Pearson, London, Water-closets.—3,972, G. A. Harvey, Lewisham, Chimney-pots and Ventilators.

Feb. 27.—3,988, T. Whitehead, Liverpool, Chimney-tops, &c.—3,998, C. J. Henderson, Edinburgh, Stoves and Ventilating Apparatus.—4,001, E. S. Norcombe, Birmingham, Rack Pulleys for Window Blinds.—4,008, J. M. Shaw, Glasgow, Fire-grates, &c.—4,021, F. J. Nibbs, London, Forms of Roofing Tiles.—4,031, T. Waller, London, Urinals.—4,037, G. Holmes, Derby, Window-sashes.—4,040, J. Gilmore and W. R. Clark, London, Ventilating Apparatus.—4,045, C. Lawrence, Southampton, Cooking-ranges.—4,047, C. Lawrence and J. Searle, Southampton, Ventilators.

Feb. 28.—4,051, W. Thompson, Stratford-on-Avon, Concrete Construction.—4,063, J. Phillips, London, Gully-tank Trap and Drain.—4,076, W. Dawes, Leeds, Water-closets.—4,094, A. Sweet, London, Ventilators.—4,110, B. Giles, London, Gully-traps.

SPECIFICATIONS ACCEPTED.†

Feb. 26.—955, J. D. Wright, London, Chimney-top and Ventilator.

Feb. 29.—671, A. Putney, London, Wood Floorings.—858, F. Matthews, Slough, Glazing.—1,630, T. Sanders, Birmingham, and T. Stubbs, London, Window-fasteners.

ABRIDGMENTS OF SPECIFICATIONS

Published during the week ending March 1, 1884.

3,151, W. Corliss, Providence, U.S.A., Fireproof Buildings, &c. (June 26, '83, price 6d.).

The walls, doors, &c., are made in any manner; but to produce tight joints round the doors when shut, locking-plates, which are mounted in the doors, are moved so as to extend across the joints and enter recesses in the casings. They are actuated by the handle, like the usual locking-bolts are.

3,157, T. H. Rees, London, Manufacture of Tile Slabs, &c. for Walls, Floors, and Hearths. (June 26, '83, 4d.).

Pieces of glass are ornamented as required, and on the backs thereof are fixed thin pieces of slate, stone, or wood, which are then covered by cement. These tiles, &c., are fixed to the walls by copper tags or tongues.

3,296, E. M. Loe, London, Window-fastenings, Com. by W. C. Loe, Paris (July 3, '83, 6d.).

In a vertical plate on the lower rail of the upper sash is an oval hole, and on the upper rail of the lower sash is mounted a spring bolt, which has an oval head. When this is passed through the hole the bolt is turned, and thereby locked.

3,309, A. Tylor, London, Apparatus for preventing Waste of Water (July 4, '83, 2d.).

The short leg of the syphon opens into a chamber in the cistern, and a flap in this chamber forces a sufficient quantity of water up the short leg to fill the bend and start the syphonic action. (*Pro. Pro.*)

3,315, W. Wade, Crewe, Fire-grates, Kitchen Ranges, &c. (July 5, '83, 2d.).

The fireplace has a bottom capable of being moved up and down in an enclosed space below. When the fireplace is filled with coal, and the fire is lighted at the top, the bottom is raised as the coal is burned. (*Pro. Pro.*)

3,396, D. Timings and S. Timings, Birmingham, Construction of Door-springs (July 9, '83, 6d.).

On the spindle round which the spring is wound is a toothed wheel, and a hole is made through the top of the casing. The spring can be wound up to any required tension, and secured by passing a pin through the hole to engage one of the teeth of the wheel.

3,467, H. J. Haddan, London, Grates. Com. by E. Breslauer, Berlin. (July 13, '83, 4d.)

The grate has a number of disc-shaped or polygonal sections mounted on shafts, and made of metal or earthenware, by which a greater supply of air is admitted.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

† Open to public inspection for two months from the dates named.

MEETINGS.

SATURDAY, MARCH 8.

Architectural Association.—Visit to the Brompton Oratory. 3 p.m.

Artisans' Technical Association (1, Adam-street, Adelphi).—Mr. C. T. Millis on "Trades' Technical Education." 8 p.m.

Royal Institution.—Captain Abney, R.E., F.R.S., on "Photographic Action Considered as the Work of Radiation" (II.). 3 p.m.

MONDAY, MARCH 10.

Royal Academy.—Mr. E. J. Poynter, R.A., on "Sculpture." 8 p.m.

Surveyors' Institution.—Mr. A. J. Burrows on "The Construction and Maintenance of Country Roads." 8 p.m.

London and Middlesex Archæological Society.—(1) Mr. Henry Poole on "The Four Northern Chapels of the Apse of Westminster Abbey;" (2) Mr. Thomas Milbourn on "London Clubs;" (3) Mr. John E. Price "On the Recovered Monumental Brass of Sir John Popham." 8 p.m.

London Institution.—Mr. Frederic Harrison on "London as a Historical City." 5 p.m.

Society of Arts.—Professor W. Chandler Roberts, F.R.S., on "The Alloys used for Coinage." (Cantor lecture.) 8 p.m.

TUESDAY, MARCH 11.

Institution of Civil Engineers.—8 p.m.

WEDNESDAY, MARCH 12.

Architects' Benevolent Society (9, Conduit-street, W.)—Annual General Meeting. 5 p.m.

Civil and Mechanical Engineers' Society.—Mr. A. J. Gale on "American Construction." 7 p.m.

Society of Arts.—Lieut.-Gen. F. H. Rundall, R.E., on "Water Regulation in regard to Floods, Drainage, and Transit." 8 p.m.

THURSDAY, MARCH 13.

Society of Antiquaries.—Mr. H. J. Napper on "The Sites of Clausentum and Venta Belgarum and other Stations mentioned in the Itinerary of Antoninus." 8.30 p.m.

Society of Engineers.—Mr. J. W. Wilson, jun., on "Roof Construction." 7.30 p.m.

Royal Academy.—Mr. J. E. Hodgson, R.A., on "The Library of the Royal Academy." 8 p.m.

Society for the Encouragement of the Fine Arts.—Mr. W. H. Cope on "Jade,—its Peculiarities and Mode of Treatment, Artistic and Mechanical." 8 p.m.

Society of Arts (Applied Chemistry and Physics Section).—Dr. P. F. Frankland on "The Upper Thames as a Source of Water Supply." 8 p.m.

Society of Telegraph Engineers and Electricians.—Mr. W. H. Massey on "A Train-lighting Experiment." 8 p.m.

Parkes Museum.—Dr. Henry Veale on "Organisation and Management of Field Hospitals." 5 p.m.

Royal Institution.—Professor Tyndall on "The Older Electricity: its Phenomena and Investigators." (III.) 3 p.m.

London Institution.—Prof. E. Pauer on "Romanticism in Music." 7 p.m.

FRIDAY, MARCH 14.

Architectural Association.—Mr. Hampden W. Pratt on Shams." 7.30 p.m.

Miscellanea.

General Engineering Construction.—The third of a course of lectures on "General Engineering Construction," by Mr. J. W. Wilson, vice-president of the Crystal Palace School of Practical Engineering, was delivered on the evening of February 28, in the reading-room of the Society of Engineers, Victoria-street, Westminster, Mr. Chas. Gandon, vice-president, in the chair. The lecturer, after pointing out, by way of introduction, the importance of actual experience in such matters as the subject of the lecture, proceeded to give some useful practical hints upon patternmakers' tools and their use in the preparation of patterns. Touching upon the designing of castings, he passed on to the consideration of different kinds of patterns, cores, core-boxes, &c., and then explained, by means of diagrams and models, the general arrangement of foundries, the nature and operation of cupolas, foundry-ladles, cranes, travellers, &c. Proceeding with the subject of moulding in different materials, he explained the chief defects incidental to castings, and passing on to the different kinds of moulds for open and closed work, he concluded by considering the nature of arrangements for large castings, with special reference to the large pipe works at Messrs. Cochrane's Woodside Ironworks. He also described their process of testing.

Royal Hibernian Academy, Dublin.—On Monday last the Royal Hibernian Academy's Exhibition was opened for the season by the Lord Lieutenant and the Countess Spencer. The Viceregal party were received by the President of the Academy (Sir Thomas A. Jones), Messrs. Henry E. Doyle, C.B.; Thomas Drew, James Brenan, P. Vincent Duffy, Thomas Farrell, James Farrell, Charles Grey, Arthur J. Mayne, James H. Owen, Catterson Smith, B. Colles Watkins, Academicians; and W. J. Fitzpatrick, John T. Gilbert, and Walter F. Osborne, hon. members.

Architects' Benevolent Society.—The annual general meeting of the subscribers and donors will be held at the rooms of the Institute on Wednesday next, at five o'clock.

The Royal Commission on the Housing of the Poor.—It is announced in Tuesday's *London Gazette* that the Queen has been pleased to issue a Commission, under her Majesty's Royal Sign Manual, "to inquire into the housing of the working classes." Sir Charles Dilke is nominated as Chairman, and the following are appointed Royal Commissioners:—The Prince of Wales, Cardinal Manning, the Marquis of Salisbury, Earl Brownlow, Lord Carrington, Mr. George Joachim Goschen, M.P., Sir Richard Assheton Cross, M.P., the Bishop-Suffragan of Bedford, Mr. Edward Lyulph Stanley, Mr. W. T. M'Cullagh Torrens, M.P., Mr. Henry Broadhurst, M.P., Mr. Jesse Collings, M.P., Mr. George Godwin, and Mr. Samuel Morley, M.P. The Commissioners are authorised to call before them, or any five or more of them, all such persons as they may judge most competent, by reason of their situation, knowledge, or experience, to afford correct information on the subject, and also to call for, have access to, and examine all such books, documents, registers, and records as may afford them the fullest information on the subject. They are empowered to visit and personally inspect such places in the United Kingdom as they may deem expedient, and they are directed with as little delay as possible to report upon the matter submitted for their consideration. Mr. John Edward Courtenay Bodley, Barrister-at-Law, Master of Arts, is appointed Secretary to the Commission.

Sewage and Plumbing Work.—What the *Glasgow Herald* describes as "a small proportion" of the members of the Architectural Section of the Glasgow Philosophical Society met on Monday evening, in the rooms in Bath-street, to hear papers on "Sewage" and "Sanitary Plumber Work," by Messrs. David Thomson and A. Lindsay Miller respectively. Mr. Thomson's chief point in treating the subject of "Sewage" was the separation of the excremental matter of the sewage from the rainfall and waste water from dwelling-houses and manufactories that at present were together discharged into the river. He advocated the formation of intercepting sewers for the reception of the house sewage, which could then be cleansed by precipitation and filtration, the sludge used for manure, and the water carried into the river. By some such plan the Clyde might, he believed, be changed from its present filthy state. Mr. Miller, in his paper on "Sanitary Plumber Work," noted the improvements that had been recently introduced, and expressed the conviction that these were but steps towards greater perfection. He confined his remarks to that section of plumber work connected with water-closets, baths, &c., leaving out of consideration the matter of water supply.

The Longfellow Memorial.—On Saturday last the bust of Longfellow, by Mr. Brock, A.R.A., was unveiled in Westminster Abbey, in the presence of a considerable number of persons interested in the matter, including the daughters and niece of the poet, Earl Granville, Mr. Russell Lowell and other members of the American Legation, Mr. Childers, Sir Theodore Martin, Mr. George Godwin, Mr. Karl Blind, Mr. Hyde Clarke, and others. The sub-Dean, Canon Prothero, in the unavoidable absence of the Dean owing to a family bereavement, unveiled the bust; and speeches were made by Earl Granville, Mr. Russell Lowell, Mr. Childers, and Dr. W. C. Bennett, the hon. secretary for the memorial fund. The bust, however, having been unveiled, has been, up to the moment of writing this, in a veiled state again, and the pedestal taken down apparently for some more permanent fixing. To announce a monument as "unveiled" and then cover it up again during just the few days when every one is interested in it and going to look at it is, to say the least, bad management.

Wrought Iron Gates.—Messrs. Barnard, Bishop, & Barnards have erected some cast-iron gates of rather exceptional size at the entrance to the Great Eastern Railway depôt, facing High-street, Bishopsgate. The gate to the entrance to the incline is 28 ft. wide by 16 ft. high in one leaf. It hangs on a cast-iron pier, and special machinery has been constructed for opening and shutting it. The design of the gates is by Mr. A. Barnard, of the firm, and is superior to the average of what may be called commercial work of this kind.

The Sportsman's Exhibition.—The third annual Sportsman's Exhibition is now open at the Agricultural Hall, Islington, and will remain open until the 15th inst.

Zinc in Drinking-Water.—It seems that there is some danger attendant upon the use of galvanised iron water-pipes. Mr. J. Raglan Thomas, the medical officer of health for Llanelly, recently detected zinc in the water supplied through about half a mile of galvanised iron pipe to the village of Cwmfelin. Samples of the water, before and after its passage through the pipe, were sent to Mr. Heaton, of Charing-cross Hospital, who has published the results in the *Chemical News*. The water as it leaves the spring at Penderry is remarkably pure, containing in one gallon 10·8 grains total solids, 1·47 chlorine, ·056 nitrogen as nitrates, and no ammonia. After leaving the pipe the total solids had risen to 18·9, of which 6·41 consisted of zinc carbonate. The chlorine was unchanged, but the nitrates had disappeared, and were replaced by ·008 of ammonia, obviously formed by the reducing action of the zinc-iron couple. The zinc was found to be present as carbonate dissolved in free carbonic acid. It was found by independent experiment, that pure zinc is rapidly dissolved when placed in water through which a current of oxygen and carbonic acid gas is passed. The solution of ferrous carbonate by carbonic acid is well known. Many chalybeate springs contain iron in this condition. When such water is exposed to the air the iron is deposited as ferric oxide, which forms the well-known rusty incrustation round the spring. Zinc dissolved in this way could, of course, be separated from the water by boiling or by precipitation with lime or sodic carbonate, but these processes could hardly be applied to a town supply.—*The Lancet*.

The Inhabited House Duty.—In the House of Commons, on the 29th ult., on the order for Committee of Supply, Mr. Alderman Lawrence moved his annual resolution, "That in order to afford facilities for adapting buildings, and parts of buildings, for the occupation of the labouring poor, and in order to offer inducements for the erection of houses and blocks of buildings specially suitable for artisans and labourers, it was absolutely essential the restrictions as to size and mode of construction at present entailed by the Inhabited House Duty Acts should be removed and the tax repealed." In making this proposal, the hon. member described the impost as being unequally and unjustly assessed, and as a tax upon health, morality, and decency. The Chancellor of the Exchequer, who opposed the motion, admitted that, as in the case of every other tax, there were grave objections to this duty, but it produced £1,800,000 a year, and in itself was not a bad tax. If, however, on some future occasion circumstances were more favourable, it might perhaps be put on a better footing. Eventually Mr. Lawrence intimated his willingness to withdraw the motion; but, this being objected to, it was put and negatived.

The Government of London.—At a special meeting of the council of the London Municipal Reform League, held at Lancaster House on Thursday [the 28th ult.] it was resolved that,—"This meeting regards with anxiety the delay in introducing the long-promised London Government Bill, and requests her Majesty's Ministers to name a day for its introduction before Easter, and that the honorary secretary be instructed to convene an early conference of delegates to consider the propriety of calling a mass meeting to protest against any further delay."—*The Metropolitan*.

Pepys Memorial.—The result of the labours of the committee formed to consider the best means of obtaining a satisfactory memorial of Samuel Pepys, the diarist, is an appropriate monument, designed by Mr. A. Blomfield, which has been erected in the church of St. Olave, Hart-street, E.C., where Pepys is buried. The monument will be unveiled by the Right Hon. the Earl of Northbrook, K.C.S.I., First Lord of the Admiralty, on Friday, the 14th inst., at 3 p.m., and his lordship will be assisted on the occasion by His Excellency the United States Minister. We understand that the committee still require some more subscriptions.

The Zeughaus at Dresden.—The Saxon Government brought forward last November a proposal for the rebuilding of the Zeughaus at Dresden, and its adaptation to the purposes of a State Archives Office and a Museum. The arrangements for keeping State papers have long been found insufficient, and various collections of plaster casts, steel engravings, drawings, &c., have accumulated in such a manner as to necessitate increased accommodation being provided for them. The total cost is estimated at about 62,000*l*.

Proposed Organ Manufactory, Kendal. Messrs. Wilkinson & Sons., of this town, propose building immediately large organ manufactory, pianoforte saloons, offices, &c., and residence. The available floor-space for business purposes will be over 9,000 superficial feet, and when complete the building will be one of the largest of its class in the North of England. The design will be Gothic freely treated; free-stone dressings will be used to the front elevations, and the works will be entered by a handsome porch with deeply-moulded arch and granite columns. The entire frontage of the whole block will be 170 ft., which will face the river Kent. The plans have been arranged and the designs made by Mr. Eli Cox, architect, of Kendal.

Lead versus Pot Pipes.—Under this head a correspondent writes:—"An accident has happened which it is desirable should be made known to others who use lead pipes. A bad smell having been noticed in the closet an examination was made, and it appears that the rats had run up the drain and bitten a hole through the lead pipe, the consequence of which was shocking and dangerous. A pot pipe has now been substituted which will, no doubt, effectually keep out the rats."

Birmingham Architectural Association.—An ordinary meeting was held on Tuesday, the 26th ult., under the presidency of Mr. W. H. Kendrick. Mr. W. Henman was elected an ordinary member. A paper was read on "Flowers, Fruit, and Flirtations under Glass," by Mr. B. McEvoy. A discussion ensued, in which Messrs. Scruton, Cotton, McConnal, and Franklin Cross (hon. sec.) took part. At the close a vote of thanks was presented to the reader of the paper.

A Correction.—We have been asked to state that the hot-water apparatus for warming the new Infants' School at Carshalton was fixed by Messrs. J. Jones & Sons, hot water engineers, and not by *Mr. Jones*, as given in our article upon Carshalton. The same firm were also entrusted with the heating of St. Mary Magdalene Church, Munster-square, N.W., the re-opening of which was announced in our last number.

Carlisle.—New Presbyterian Sunday Schools have been opened here. They have been substantially built by Mr. George Black, the contractor, from the designs of Mr. George D. Oliver, architect, Carlisle.

TENDERS.

For the erection of fifty-seven cottages at Cathay, Cardiff, for the Cardiff Railway Workmen's Cottage Company, Limited. Quantities by the architect, Mr. J. P. Jones, 26, Park-street, Cardiff:—

S. Shepton	£12,050 0 0
C. Shepherd	11,619 0 0
W. T. Clarke	11,200 0 0
J. Gough	10,150 0 0
W. Symonds	9,690 0 0
Purnell & Fry	9,519 0 0
D. Davies	9,500 0 0
J. G. Green	9,450 0 0
Battye & Thomas	9,386 0 0
W. A. Walters	9,245 0 0
E. A. Smith	8,998 0 0
H. Brown	8,806 0 0
Job Thomas & James	8,720 0 0
D. J. Davies (accepted)	8,500 0 0
E. Cox	7,000 0 0

For the formation of roads, sewers, &c., at Canton, Cardiff, for the Glamorgan Workmen's Cottage Company. Messrs. James Seward & Thomas, architects and surveyors, Cardiff:—

T. Thomas	£694 13 0
R Day	681 0 0
Jepson Bros.	630 0 0
J. C. Pearson	620 19 0
R. Smith	584 12 7
A. Green	573 1 6
T. Rees (accepted)	503 5 0

For the restoration of Birtley Church, North Tyne for the Rev. G. R. Hall. Mr. Arthur P. Plummer, architect and surveyor, 46, Cloth Market, Newcastle-on-Tyne:—

Contract No. 2.

Robson & Tremble, Hetton-le-Hole	£724 0 0
M. Martinson, Corbridge	690 0 0
Milburn & Gibson, Benfieldside	638 9 0
W. Welton, Mollow Burn, Wark *	633 9 0

* Accepted.

Carpenter's Work only.

J. Adamson & Son, Shildon	£356 5 0
G. Graydon & Son, Durham	286 11 6

Mason's Work only.

T. & W. Bell, Bellingham	£294 0 0
W. Welton, Mollow Burn	225 13 0

For the erection of villa residence at Croydon, for Mr. J. S. Downton. Mr. H. J. White, architect, Wallington, Surrey:—

J. Horrocks	£650 0 0
Smith & Bulled	579 0 0
Howe & White, Wallington (accepted)	525 0 0

For King's Bridge, Swallowfield. Messrs. Morris & Stallwood, architects and county surveyors:—

Brickwork, &c.

J. Winter, Reading	£286 0 0
F. Talbot, Caversham	268 13 4
T. Godwin, Reading	265 0 0
H. & A. Lewis, Reading	264 0 0
E. Wheeler, Swallowfield	243 19 0
W. H. Simonds, Reading	240 0 0
H. Tame, Shinfield	230 0 0
W. H. Woodroffe, Reading	209 0 0

Ironwork.

Bridge and Roofing Co., Darlaston	£514 18 5
Stockton Forge Co.	434 16 9
H. Young & Co., Pimlico	425 0 0
A. Handyside & Co., Derby	402 0 0
J. O. Gardner & Co., London	398 10 9
W. H. Simonds, Reading	395 0 0
Morewood & Co., Birmingham	384 0 0
M. T. Shaw & Co., London	382 5 0
E. Finch & Co., Lim., Chepstow	370 0 0
J. Shewell & Co., Darlington	357 0 0
Reading Ironworks	335 0 0
Carter, Ford, & Co., Darlaston	324 4 8
S. Griffith, Reading	320 3 9

For additions and alterations to boys' school, for the Ormesby School Board. Mr. John W. Alexander, architect, Middlesbrough:—

J. Johnson, Middlesbrough	£813 15 0
W. & G. Readman, North Ormesby	794 5 7
R. Wilkinson, Middlesbrough	790 3 4
A. King, North Ormesby	785 18 7
J. Dickinson, Saltburn	745 0 0
Sturdy Bros., Middlesbrough	727 10 0
A. White, Gainsborough*	661 0 11

* Amended tender (accepted) £935 9 0

For the erection of stabling at Eastbourne for sixty horses, with proportionate harness room and carriage accommodation, &c., for Mr. S. H. Weston. Mr. Oliver Mitchell, architect, Eastbourne. Quantities supplied:—

Cornwell & Son, Eastbourne	£5,050 0 0
J. Hurst, Eastbourne	4,684 0 0
Dore & Sons, Eastbourne	4,477 0 0
J. Peerless, Eastbourne	4,213 0 0
J. Longley, Crawley (accepted)	4,095 0 0
Hudson, Kearley, & Co., Brighton	3,550 0 0

For the construction of new pier approaches, toll-houses, &c., to Southend Pier, Essex. Mr. Arthur Cayton, surveyor, and Mr. Edward Wright, architect. Quantities by Mr. R. E. Carpenter, Stapenhill, Burton-on-Trent:—

	No. 1.	No. 2.
Joseph Bullock, Southend	£4,792 0 0	£2,885 0 0
B. Cooke & Co., Phœnix Wharf, Church-road, Battersea	4,250 0 0	—
John J. Robson, Marlborough-road, Snaresbrook	4,159 0 0	2,692 0 0
J. W. Steward, Southend	4,094 11 6	2,343 18 0
Bottoms, Bros., 27, Basnett-road, Lavender-hill, Battersea	4,084 0 0	1,882 0 0
Baker & Wiseman, Southend	3,993 13 0	2,389 3 0
Samuel Chafen, Rotherhithe	3,936 0 0	2,060 0 0
G. J. Stead & Co., No. 69, Zetland-street, Southport	3,870 0 0	—
S. Darke & Son, Southend	3,630 0 0	2,240 0 0
Wm. Wood, Chelmsford	3,550 0 0	1,770 0 0
J. E. Potter, Southchurch Beach, Southend	2,434 13 2	1,564 15 9

For the erection of a villa residence at Raynes Park, for Mr. Hodge. Mr. A. Stubbs, architect:—

Monday	£895 10 0
R. M. Priestley	829 0 0

For building a workshop at 181, Hanbury-street, Mile End New Town, for Mr. S. Locks. Mr. Edward Brown, surveyor, Hanbury-street, Spitalfields:—

C. Marr	£118 0 0
S. Hawkings (accepted)	112 0 0
Impy	96 0 0

For alterations to the College Arms, Old Bethnal Green-road, for Mr. A. H. Craddock. Mr. Edward Brown, surveyor:—

S. Salt	£615 0 0
Jackson & Todd	510 0 0
C. Marr	490 0 0
S. Hawkings	466 0 0

For repairs to the Clarence Arms, Plumstead-road, South Woolwich, for Messrs. Truman, Hanbury, Buxton, & Co. Mr. Edward Brown, surveyor:—

J. May	£209 0 0
S. Hawkings	163 0 0
J. Christoffer	159 0 0
G. Read (accepted)	157 15 0

For works to be executed for Mr. L. Spackman, 9 and 10, Temple-lane, and No. 14, Bouverie-street, Fleet-street. Messrs. Perry & Reed, architects. Quantities supplied:—

Clarke & Bracey	£2,262 0 0
Clements	1,795 0 0
Nottle	1,784 0 0
Brunsden	1,726 0 0
Oliver	1,693 0 0

For house at Hendon, for Mr. Elliot. Mr. John Farrer, architect, Albion Chambers, Finsbury-pavement:—

Gibbs & Imber	£2,049 0 0
Oldrey	1,897 0 0
Rhodes	1,865 0 0
Wilkinson Bros.	1,777 0 0
Conder	1,730 0 0
W Smith	1,719 0 0
Smith & Sons	1,697 0 0
Marriage	1,649 0 0

For additions to shops at Plumstead, for the Woolwich Royal Arsenal Co-operative Society. Mr. J. F. Goodey, architect, Colchester:—

Bowdige & Burley	£3,090	0	0
Arnold & Sons, Plumstead	2,324	0	0
Proctor, Woolwich	2,200	0	0
Hosking, Stratford	2,086	0	0
Oldrige, Colchester	2,049	0	0
Redman, Brockley	1,997	0	0
Dobson, Colchester	1,980	0	0
Dupont, Colchester	1,953	0	0
Coombs, Plumstead	1,950	0	0
Avard, Maidstone	1,914	0	0
D. & A. Brown, London	1,889	0	0
Pyle & Co., London	1,820	0	0
Lonergan, Plumstead	1,813	0	0
Johnson, Woolwich (accepted)	1,750	0	0
Harriss, Woolwich	1,748	0	0
Watson, Dulwich	1,725	0	0
Forsdyke, Plumstead	1,334	5	6

For the erection of an infirmary at Dover Union. Messrs. Trevor & Cresswell, architects, 53, Castle-street, Dover. Quantities supplied by architects:—

Sergent & Tottman, Bekesbourne	£5,500	0	0
W. Brooks, Folkestone	5,000	0	0
M. A. Welch, Dover	4,350	0	0
J. Bull, Son, & Co., Southampton	4,107	0	0
J. G. Jackson, Dover	4,100	0	0
T. J. Chamberlain, Dover	4,099	0	0
Austen & Lewis, Dover	4,070	0	0
W. J. Adcock, Dover	4,025	0	0
Lewis & Chandler, Dover	4,000	0	0
W. J. Wiles, Dover	3,989	0	0
H. Richardson, Dover	3,949	0	0
G. H. Denne & Son, Deal	3,875	0	0
W. T. Dowle, Dover	3,786	0	0
W. J. Bromley, Dover	3,730	0	0
W. G. Lewis, Dover	3,717	0	0
H. Stiff, Dover (accepted)	3,685	0	0

For proposed class-rooms and improvements to the National Schools of St. Mary-the-Less at Lambeth. Mr. J. Llewellyn Wilson, architect. Quantities by Messrs. Beesley & Williams:—

W. Brass	£1,412	0	0
Colls & Sons	1,385	0	0
Heath	1,260	0	0
W. Parker	1,246	0	0
Mark Manley	1,237	0	0
Alfred Roome	1,228	0	0
G. F. Williams	1,148	0	0

For the erection of a wall to enclose the grounds of Chiswick House. Mr. Henry Currey, 37, Norfolk-street, Strand, W.C., architect:—

Nowell & Robson, Kensington	£2,697	0	0
Eydmann, Turnham Green	2,510	0	0
Haywood, Eastbourne	2,197	0	0
Arundell & Son, Chiswick (accepted)	1,968	0	0

For making main sewer and works connected therewith at Glaslyn-street, Portmadoc, for the Ynyscynhaiarn Local Board. Mr. Thomas Roberts, Assoc. M. Inst. C.E., engineer:—

Davies & Edwards, Aberystwith	£170	14	0
Owen, Portmadoc	153	0	0
Hughes, Portmadoc	132	0	0
Davies, Portmadoc (accepted)	104	1	6
Engineer's estimate	138	18	0

For villa residence at Wrotham Heath, Kent. Mr. H. Hardwicke Langston, architect. Quantities by Mr. W. C. Brangwyn:—

Nightingale	£1,206	0	0
Iggulden	1,029	0	0
Harris & Wardrop	997	0	0
Johnson & Co.	994	0	0
Charlwood Bros.	970	0	0
Burgess & Langridge	943	0	0
Bishop Bros.	902	10	0
Pryer & Co. (accepted)	849	0	0

For additions to Cross Oak, Great Berkhampstead, Herts, for Colonel Hanbury Barclay. Mr. Frank E. Thicke, architect. Quantities by Mr. H. C. Leete:—

Hailey, Watford	£507	0	0
Matthews, Berkhampstead	455	0	0
Henderson, Highbury	429	10	0

For alterations to schools and new caretaker's house at Hollydale-road Schools, Peckham, for the London School Board. Mr. E. R. Robson, architect:—

Roy	£660	0	0
Pritchard	582	0	0
Goad	526	0	0
George B. Ash	491	0	0
Jerrard	475	0	0

For alterations for Mr. Josephs, Newington Butts. Mr. Banister Fletcher, architect:—

Rice	£427	0	0
Cock	420	0	0
Young	414	0	0

For shops to be erected in Brent-street, Hendon (first contract). Mr. Banister Fletcher, architect:—

J. Ellacott (accepted)	£1,450	0	0

For warehouses, Nos. 5 and 7, Peacock-street, for Mr. Henry Soden. Mr. Banister Fletcher, architect:—

Young	£721	10	0
Downs	635	0	0
Burman & Sons (accepted)	626	0	0

For alterations and additions to Thistleton Shooting Box, Preston, Lancashire. Messrs. Myres, Veevers, & Myres, architects, Preston and Westminster. Quantities by the architects:—

John Walmsley	£1,853	19	6
Richard Heathcote	1,792	18	2
Robert Saul (accepted)	1,740	0	0

For new residence, stables, &c., at Leyland, Preston. Messrs. Myres, Veevers, & Myres, architects:—

J. Walmsley	£747	0	0
R. Heathcote	728	0	0
Robert Saul (accepted)	705	0	0

For the construction of new roads on the Bridge House Estate, Brockley, for the Land Development Association, Limited:—

A. Oliver (accepted)	£1,224	0	0

For the erection of a cottage and boundary-walls in George-street, Camberwell, for the Manor Steam Works. Mr. James W. Irwin, architect:—

H. Burman & Sons, Kennington	£248	13	0

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

TO CORRESPONDENTS.

G. T.—W. P. B.—R. B. (have not space, much of the matter having been made public before).—S. H. (cannot afford time to read such illegible manuscript).—W. F. P. (no space this week).—J. W. H. (ditto).—W. P. P. B. (ditto).—C. P. (ditto).—M. P. B. (ditto).—F. E. (cannot publish letters that are printed and sent round to various quarters. See "standing order" below).—B. Bros.—L. and W. (amount should be sent).—J. C. (thanks; will consider it).—"A Competitor who was in Time" (too late for us this week).—W. L. (next week).

Correspondents should address the Editor, and *not* the Publisher, except in cases of busines.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

PUBLISHER'S NOTICES.

THE INDEX and TITLE-PAGE for Volume XLV. (July to December, 1883) were given as a Supplement with the number of January 12, and A COLOURED TITLE-PAGE was issued the following week, in substitution for that published previously.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING-CASES (Cloth), with strings, to hold a Month's Numbers, price 2s. each; also

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PERSONS Advertising in "The Builder," may have *Replies addressed to the Office*, 46, Catherine-street, Covent-garden, W.C. *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

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Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

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RANDELL, SAUNDERS, & CO., Limited,
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[ADVT.

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